

THE IRON AGE

Special Articles



"A Practical Evaluation of Ductile Cast Iron," starting on p. 75, presents in part one of a two-part article, the foundry practice, mass effect, heat treatment, and impact strength of ductile iron as evaluated from tests conducted by Cooper-Bessemer. The operation of the Rossi continuous casting machine in the Bristol Brass foundry and the advantages resulting from this installation are discussed in "Continuous Casting at Bristol Brass," p. 80.

Issue Highlights



Men whose achievements have contributed most to the metalworking industry during the past year will be honored in the Annual Issue of THE IRON AGE, Jan. 5, 1950: Readers are urged to fill in, clip and mail the ballot that appears in this issue.—p. 103.



Some steel firms are going to price their products more realistically in 1950. Higher steelmaking raw material costs, the continuing need to replace obsolete equipment and coming boosts in labor costs dictate increases, steel men say. Some may be in extras, some in base prices.—p. 101.



The 3-day week in the coal mines, to which the industry returned this week, is not going to cost any steel production. Steel companies will dig into coal reserves to augment limited output. They can hang on until other shortages force action on the current 2-day a week strike.—p. 108.



Barring strikes in consuming industries, gray iron foundries will ship 10 million tons of castings in 1950. This is consensus, but some conservatives fear drop in auto demand will lower this estimate, already 1 million tons below 1949 shipments.—p. 107.

Coming Next Week



A 300 pct increase in the production of Friden calculators through the adoption of an electrostatically sprayed wrinkle finish is discussed in an article appearing next week. Details of the application of the wrinkle finish with a discussion of the resultant decrease in rejects and greater paint coverage are also presented.

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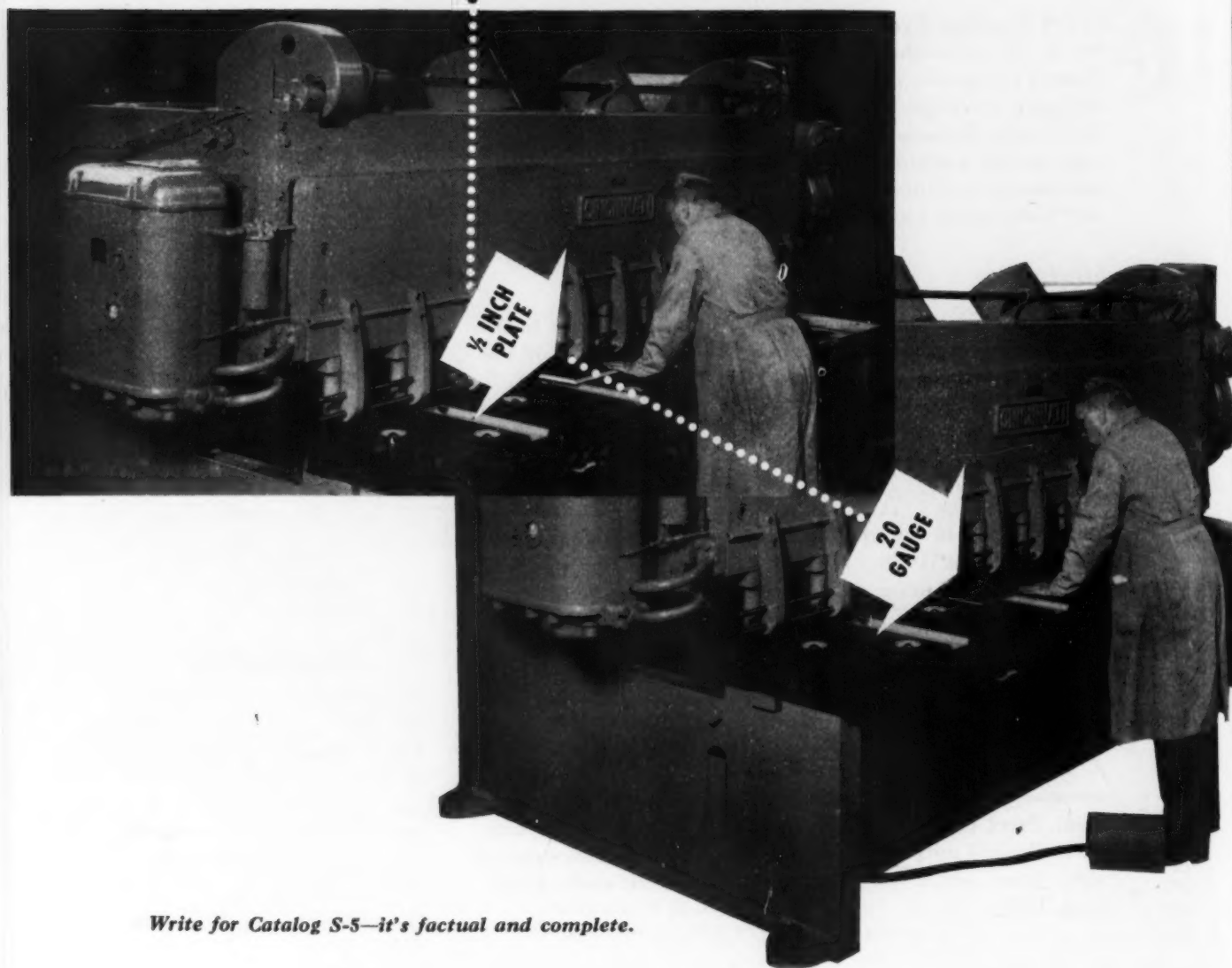
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Editorial

INDUSTRY VIEWPOINTS

Let's Make Promises

EVERYONE would like to live in some tropical paradise where everything is free. And so it goes. I promise you. You do this for me. Never mind if I can keep the promise. And never mind if I do keep it and make someone else pay. In the long run you usually pay. That's the way politicians and labor leaders often operate.

Industrialists and businessmen should make some promises of their own. Honest ones. Ones they talk about among themselves but don't make too much noise about. There ought to be more noise. And their promises should be shouted from the housetops.

What can the businessman promise? Plenty. He can promise that people will have more things at cheaper prices if new machines and techniques are used properly. He can promise that if risk capital comes out of the cellar the return will be good. He can promise that competition will mean better products and more of them. On competition depends a sharing of an ever bigger pie instead of dividing up an ever smaller one.

He can promise that if an honest attempt is made to administer government on a firm business basis confidence will be greater. And more chances will be taken by industrialists who are not now sure they want to go ahead with this or that. He can promise that if workers produce more in conjunction with new machines they will benefit. But these are all good promises. There are some bad ones too.

If taxes are to go too high they will kill initiative. If wages and pensions become too large a part of production costs they can hold back the very progress which is supposed to pay for them. If government continues spending more than it takes in the businessman can truthfully promise chaos.

But these kind of statements have been made over and over again. Now is the time to put emphasis on the other ones we mentioned.

Think it over. Industrialists can promise just as much as the politicians. And what's more they can make good those promises—if they can get enough people to take them seriously.

They can never get to that point if they are not vocal. The age of expediency should end. Business should talk long and loud about its part in the picture.

Maybe lawyers will be against some promises. But that does not mean they can't be overruled. Maybe the plans and promises will only be 95 pct kept because of unforeseen problems. Chances are that management can crash through with a better batting average than the politicians will ever do. And at less cost to the people.

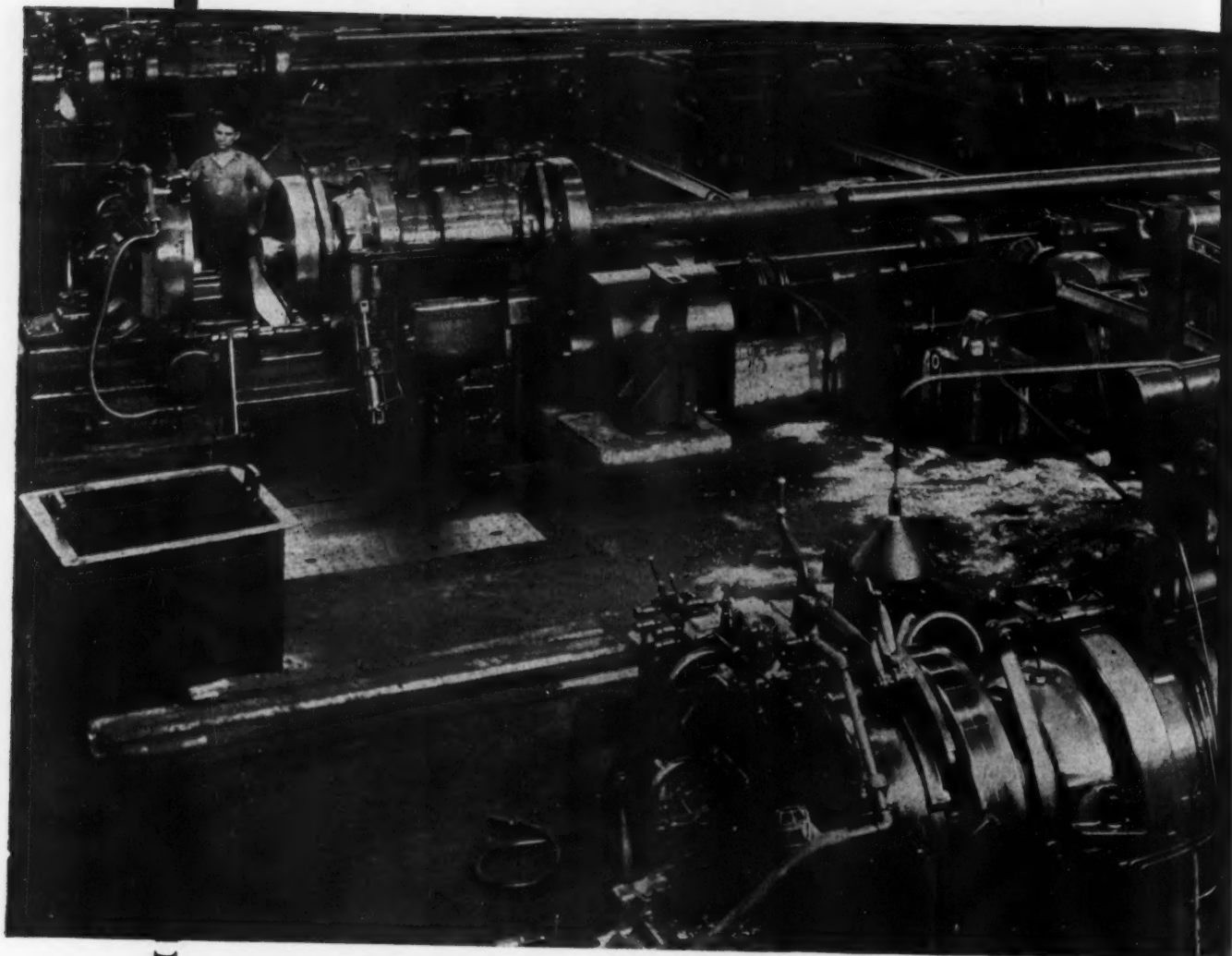
Caution is okay but it can be overdone. An honest mistake is sometimes very humanizing.

Tom C. Campbell

Editor

SAVE 5 WAYS ON

- ✓ Fewer Machines
- ✓ Lower Tool Cost
- ✓ Lower Tool Inventory
- ✓ Less Set-up Time
- ✓ Higher Production



NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► Russian success with atomic energy is believed due to brutal disregard for life or property where the interest of the state is involved, permitting it to take risky short cuts without regard for consequences. It is this, say some U. S. scientists, which permitted faster progress than they expected. The speed surprised them—despite press reports to the contrary.

The Soviet's postwar industrial recovery has also been faster than expected by experts here—measured in Russian, not U. S. terms. Improvisation is giving way to basic engineering planning and techniques. Emphasis is now being put on testing and quality control.

► Du Pont has developed a process using superheated steam instead of compressed air to spray organic finishes. Comparing favorably in cost, the new technique claims many advantages, one of them being faster coverage.

► Improved electric furnace design coupled with high power input is producing phenomenal heat times in melting low carbon steels. One producer tapped a 41-ton heat in 1 hr 29 min. He reports that steel quality improves with faster melting.

This development reflects mounting interest in melting "open-hearth" grades in electric furnaces and raises question of electric furnace v. openhearth steelmaking costs.

► Liberia may become an important source of palm oil. Present quality of Liberian shipments is normally unsatisfactory to American tinplate men but a U. S. economic mission is helping Liberians set up a grading and inspection service to improve some of the supply.

► The urge to sell some new gadget to auto producers is running high again. More than 5500 automotive patents will be issued this year. The auto industry accounts for about a sixth of all U. S. patents.

► Despite some reports to the contrary, it is believed that new car and truck inventories are still below the 1941 level. Conditions vary among producers and localities but overall average of vehicles available for sale to the public is undoubtedly less than six per dealer. Counting factory float and in transit the average is less than 10 per dealer.

► With pension payments pegged for the next 5 years, labor leaders might be expected to think twice before demanding inflationary wage boosts that would cut real income of pensioners. Chances are this won't stop the demands. Pensioners don't pay union dues.

► British engineers, who have long led the U. S. in jet engine design and construction, are debating propeller v. turbo-prop v. jet power for airliners. Opinion there is hardening along the lines that both propeller-less and propeller-driven airliners will each have a place in future air networks.

► The prediction by president Christopher of Packard that the car of 1959 may be powered by a gas turbine is being taken at face value by Detroiters. An important question is: Will adequate cooling for a turbine be available within the next 10 years?

► Analysis of 25 brass coupons taken from the latest Rossi continuous casting unit showed copper content variation from 61.27 pct min to 62.03 max (0.76 pct). This contrasts with similar samples from batch type melting which varied from 60.03 pct min to 63.4 pct max (3.37 pct).

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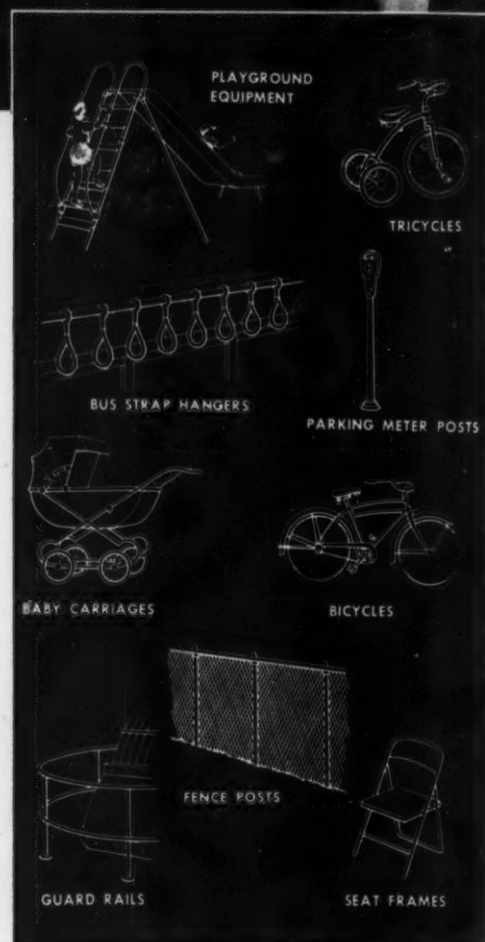
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Operating Rate Climbs to 92 Pct

Scrap Prices Drifting Downward

The Iron Age

SUMMARY

IRON AND STEEL INDUSTRY TRENDS

HIGHER steel prices moved a few steps nearer to reality this week. Several big steel companies are studying revisions of their "extra" charges. The studies are part of plans by some steel companies to price their products more realistically in 1950.

There will be important steel price increases within the next several months. Some may come as base price boosts, others as increases in extra prices (charges for specified chemical or physical characteristics). Two types of extra charge revisions are possible; (1) boosts on sheet and strip to replace cuts made when steel markets turned soft earlier this year; and (2) major changes in the method of arriving at such charges.

Many Users Expect Higher Prices

Many steel users now expect a price increase. Estimates in the buying fraternity—unconfirmed by steel companies—run from \$4 to \$6 a ton. These would be conservative guesses if most mills reinstated the sheet and strip extras which, with few exceptions, were in effect earlier this year. Buyers expect extra schedules to be the first things changed when prices are raised.

Steel price increases are now certain for these reasons: (1) Steelmaking raw material and transportation costs have risen a lot since the last general steel price increase in July 1948; (2) labor costs will shoot up next year; (3) the bulk of steelmaking machinery and equipment replacement costs must still be met out of profits; (4) the steel market is strong.

In the past 5 months the tone of the steel market has reversed itself. Before mid-July steel deliveries were normal, customers were looking forward to lower prices and durable goods manufacturers were in fair inventory shape except for some pessimistic manufacturers and retailers who had cut back too far on inventories.

Today the steel buyer is generally more concerned over delivery. Instead of pressing for lower prices he is afraid of higher costs. The pipelines of supply range from empty to fair—few are normal. Detroit is planning the biggest single month's production in history next March.

Appliance parts manufacturers say they expect 1950 to be better than 1949. Though backlogs have been cut sharply, linepipe demand remains strong.

A lowpoint in manufacturing volume will come late this month. Most companies lived off inventories through October and November and are now caught with the lowest stocks in years. Shipments are just coming through from the mills and full steel inventories will not be common until late February or March.

Conversion Steel Buying Is Orderly

The conversion steel picture shapes up this way: General Motors and Ford are in it on a fairly heavy scale. Some of the independents have followed. Buying is orderly—the triple-pass-behind-the-line-of-scrimmage stuff seems to be out this time. Multiple freight deals, if they exist at all, are in the minority. Detroiters don't expect conversion to last beyond March.

Steelmaking operations registered a 3.5 point gain this week over last week's revised rate of 88.5 pct. In pushing up to 92 pct of rated capacity the industry is back at a level untouched since last June when the rate paused briefly in that neighborhood on its way down to a miserable 62 pct during the July Fourth week.

Mills Drawing on Coal Reserves

As the coal miners trooped back to the pits on Dec. 5 to resume their 2-day-a-week strike, steel company raw materials men were generally not worried about a coal shortage hampering steel production. Supplementing restricted coal output with reserve stocks, most steel companies can operate at their present clip for at least 2 months. They figure that by then there will be coal pinches elsewhere to force action.

Steel mill scrap officials with fairly nice inventories are still indifferent about buying. There was some quiet buying in the past few weeks, but not enough to overcome the slightly soft tone of the market. No. 1 heavy melting steel prices drifted down by \$2 a ton at Chicago and \$1 a ton at Philadelphia. THE IRON AGE steel scrap composite off \$1 a ton to \$27.92 per gross ton.

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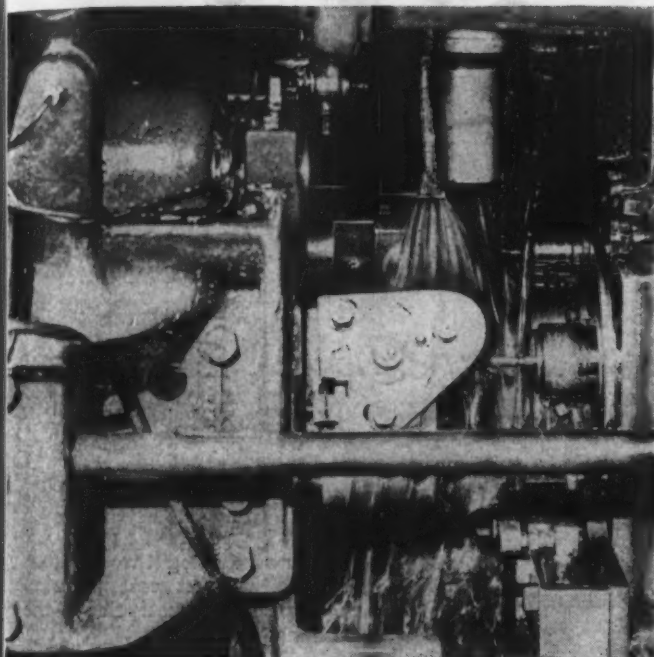
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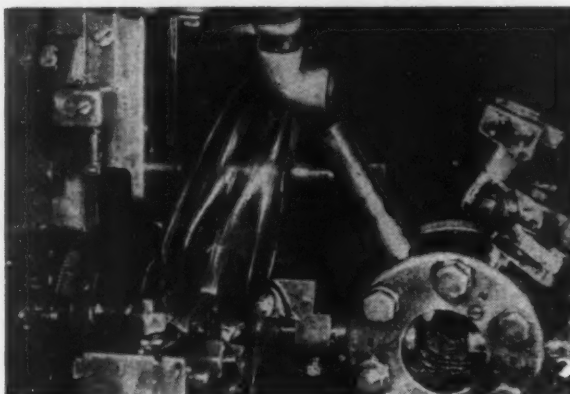


BEST ALL AROUND

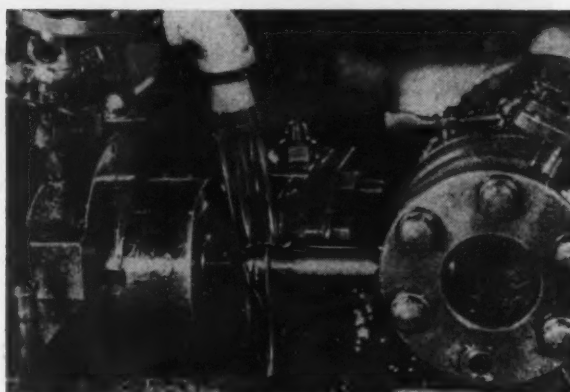
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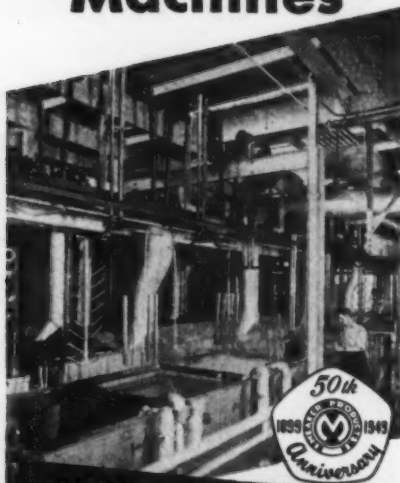


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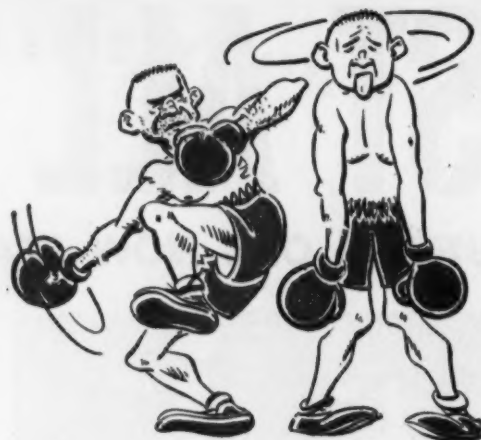
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Fatigue Cracks

By Charles T. Post

Nuggets

New hope for the brass foundries which have found the going a little rough lately, came out of Buffalo the other day.

Seems that a Canadian couple blew into town from the North Woods with a sack of gold nuggets. The sale of mining stock being closely regulated these days, they did the next best thing and sold the nuggets. Got \$6200 for 'em. The only slip they made was hanging around instead of going back to their Canadian brass foundry for more.

Now that the law has moved in, we expect to see an advertisement in the Business Opportunities column any day now: "Brass Foundry for Sale—A Little Gold Mine."

Alchemy

Gold mining stocks have been booming all over the world since the general currency devaluation which automatically boosted the price of gold. The only exception, of course, is the United States, where the fixed price of gold and rising production costs have held the miners in a vise for some time.

Any wild boom has its reaction. The kickback on the mining stock upswing came last week in Paris. News reached there somewhat tardily that atomic energy researchers had achieved the dream of alchemists over the centuries: Gold could be made artificially. Stocks suffered a quick apopleptic stroke

before news filtered through that the ersatz product cost more to make than the market price of the real thing.

Gold Lake

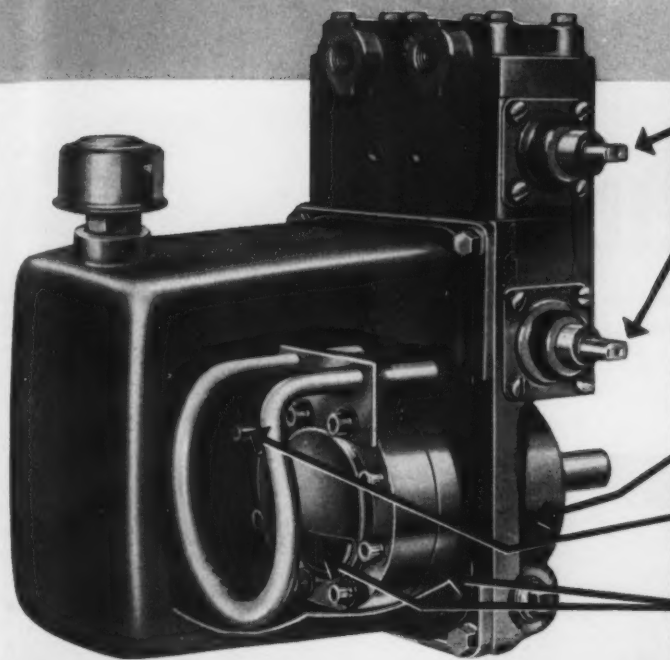
Not so long after the advance guard of gold-seeking prospectors swept through the California mountains almost a century ago, there followed the usual shrewd, quiet contingent of soft-handed capitalists. Mining claims that looked promising but needed development capital were taken over at a reasonable price.

One Eastern crowd sent its agents high into the Feather River country where they found a grizzled prospector presiding over some nuggets on the shores of a clear mountain lake. They had dickered with him all day and late into the afternoon, when one of them glanced out over the water to see that the bottom of the lake was studded with nuggets.

When we read of the vast engineering feats involved in getting iron ore from the bottom of Canada's Steep Rock Lake, we think back to the job these Eastern financiers had in getting heavy dredging equipment high into the Sierras without benefit of railroads or airplanes. Their avaricious hopes must have soared as the big dredges were assembled, and finally brought the first buckets of gravel from the bottom of the lake.

Turn to Page 164

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MORSE G. DIAL, director, Union Carbide & Carbon Corp.



KENNETH H. HANNAN, secretary, Union Carbide & Carbon Corp.



EDWIN A. BOOTH, general manager of sales, Spang-Chalfant Div., National Supply Co.

Morse G. Dial, vice-president, has been elected a director, and Kenneth H. Hannan elected secretary of UNION CARBIDE AND CARBON CORP., New York. Mr. Dial joined the corporation in 1929 as a member of the sales staff of Carbide and Carbon Chemicals Corp. He has successfully held various positions with the corporation up to his new appointment. Mr. Hannan, formerly assistant secretary and treasurer, succeeds Mr. Dial as secretary.

Fred G. Baker has been appointed director of engineering and design of the ELECTRO CHEMICAL SUPPLY & ENGINEERING CO., Emmaus, Pa. Mr. Baker was formerly a member of the engineering department of the E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Fred C. Hall has risen to director of sales of the AMERICAN COACH & BODY CO., Cleveland, succeeding Clarence G. Wood. Mr. Hall has been a member of the organization since 1936 concentrating on sales work and has represented the company in the western half of the United States. Prior to his new appointment he was general manager of the California Div.

Marvin L. Katke has been named plant manager of the projected automatic transmission plant at Cincinnati for FORD MOTOR CO., Dearborn. Mr. Katke began his association with the automotive industry in 1928 when he joined the Oldsmobile Div. of General Motors. His last post before joining Ford was superintendent of the engine plant at Lansing, Mich.

Edwin A. Booth has been named general manager of sales of the Spang-Chalfant Div. of the NATIONAL SUPPLY CO., Etna, Pa. Mr. Booth has been with the company since 1929 entering the metallurgical department of Spang-Chalfant. He has served the National Supply Organization in various capacities since then.

A. L. Roberts has been named general superintendent of the pipe line system for TEXAS GAS TRANSMISSION CORP. Mr. Roberts joined Kentucky Natural Gas Corp., a predecessor company of Texas Gas in 1930, as district pipe line superintendent. H. L. Stowers has been appointed chief engineer for the company. Mr. Stowers joined Memphis Natural Gas Co., also a Texas Gas predecessor, in 1937 as assistant chief engineer.



FRANK D. MUMFORD, parts sales manager, E. W. Bliss Co.



LEO F. BROWN, plant manager, Air Conditioning Dept., General Electric Co.



EARL W. PUGHE, manager, Manufacturing Div., Wheland Co.

Earl W. Pughe has joined the **WHELAND CO.**, Chattanooga, Tenn., as manager of the Manufacturing Div. Prior to his connection with Wheland, Mr. Pughe had been assistant to the president, Dana Corp., Toledo. He was also with the Chevrolet Div. of General Motors for 22 years.

Walter M. Bellemore has been named ballistic engineer of the **WINCHESTER REPEATING ARMS CO.**, Div. of Olin Industries, Inc., New Haven, Conn., succeeding Merton A. Robinson who has retired after 45 years of service.

Robert S. Miller has been elected executive vice-president, general manager and a director of **CLIMAX MACHINERY CO.**, Indianapolis. Mr. Miller was formerly southwestern regional manager of Ingersoll Steel Div., Borg-Warner Corp., Dallas.

Frank D. Mumford has been named parts sales manager of **E. W. BLISS CO.**, Toledo. Prior to taking over his new position, Mr. Mumford spent 23 years in parts engineering and sales work for Bliss and its Toledo division.

Leo L. Rosshirt has been promoted to resident manager of the Fisher Body Kansas City plant of **GENERAL MOTORS CORP.**, Dearborn, to succeed **H. D. Burnside**, who has been appointed manager of the Wilmington, Del., plant of the Buick-Oldsmobile-Pontiac Assembly Div. **Harry L. Emerson**, former resident director of industrial relations at the Kansas City plant, will assume the assistant resident managership held by Mr. Rosshirt. Mr. Burnside in his new position succeeds **Robert Ahlers**, who has been granted a leave of absence.

Mathew Dick, Jr., has been appointed sales engineer of the Butterfield Div. of **UNION TWIST DRILL CO.**, Derby Line, Vt. Prior to joining the company he was with the Manufacturing Research Div. and the Machine Shop & Time Study Dept. of International Harvester Co., Chicago.

Charles E. Rogers has been named sales metallurgist of **STOODY CO.**, Whittier, Calif. For the past three years, Mr. Rogers has been in charge of the metallurgical laboratory. **Paul Irish** has been appointed plant metallurgist. Mr. Irish was chief chemist in charge of melting procedure for eight years at Bethlehem Steel Corp., Seattle.

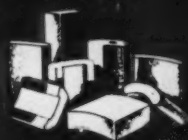
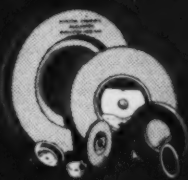
Leo F. Brown has been appointed plant manager of the air conditioning equipment plant of the Air Conditioning Dept., **GENERAL ELECTRIC CO.**, Bloomfield, N. J. Prior to his appointment, Mr. Brown was associated with the Houdaille-Hershey Corp., serving as manager of the Detroit plant. **Edward D. Kemble** has been named plant manager of the automatic heating division of the company's Air Conditioning Dept. Prior to his appointment, Mr. Kemble was plant manager of the Clark Equipment Co.'s lift truck plant in Battle Creek, Mich.

Ralph M. Whitaker has been appointed Ohio district manager for the **KASE MACHINE CO.**, Cleveland. Mr. Whitaker joined the company in mid-1949 and has directed sales efforts in the Ohio territory since that time. He is a member of the American Society of Tool Engineers and has served as a committee chairman.

Arthur J. Renz has been named field engineer on precision spindle applications for the **POPE MACHINERY CORP.**, Haverhill, Mass. Prior to his association with Pope Machinery Corp., he was with the tool and die department of General Electric Co., Schenectady, N. Y.

John D. Dunphy has been appointed sales representative of **SOSS MFG. CO.**, Detroit. Mr. Dunphy will represent the company's products in the state of Kentucky and the city of Evansville, Ind.

Turn to Page 130



Now Is the Time to Cut



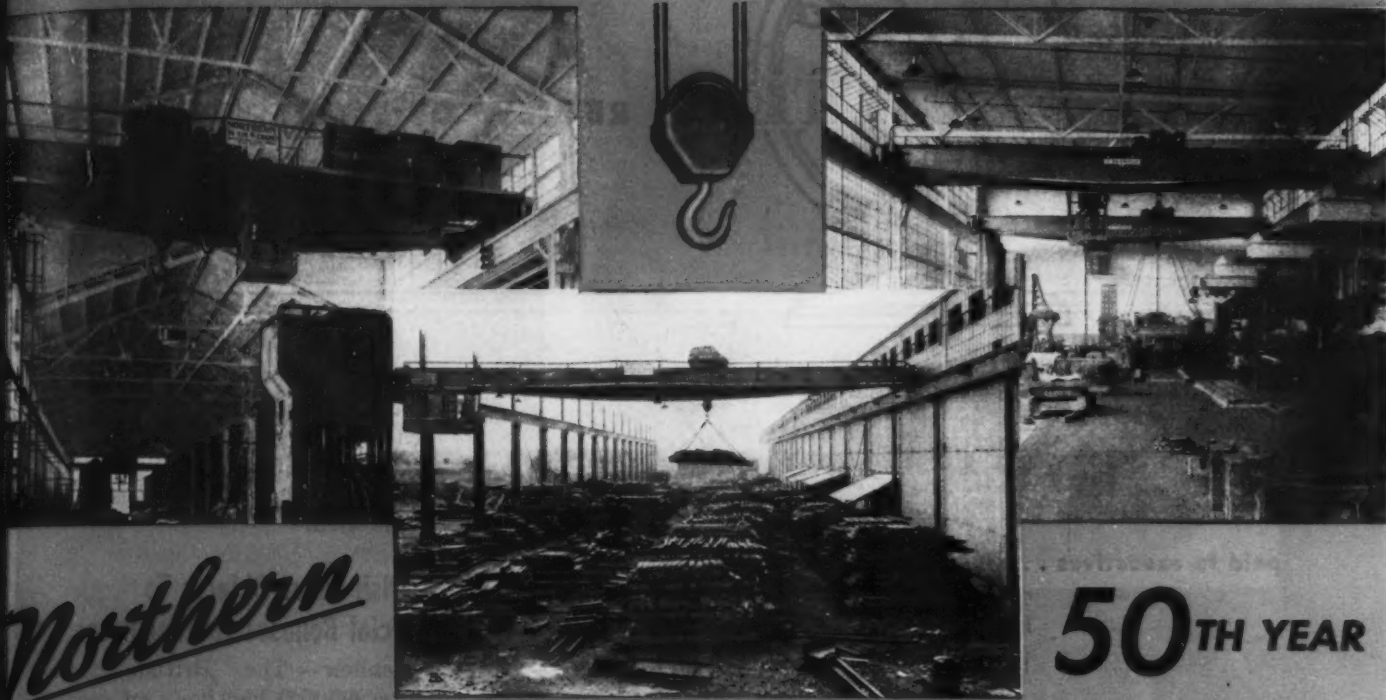
Skillful Engineering *backed by* Progressive Research



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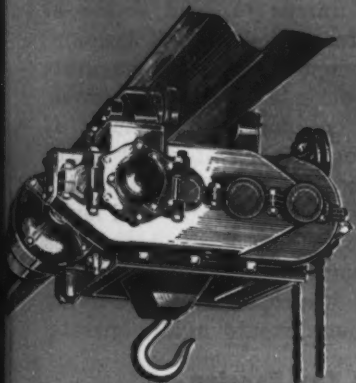
For Fast, Continuous Overhead Material Handling



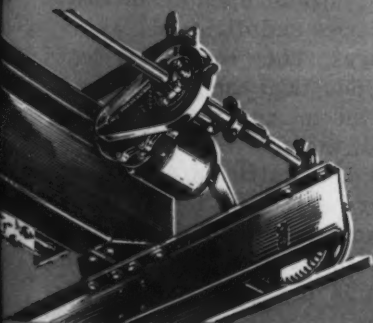
Northern

50TH YEAR

overhead electric traveling cranes



hi-lift hoists



travelators

Designed and constructed for severe, heavy duty service, **NORTHERN CRANES** are available in three basic types: (1) **NORTHERN SUPER CRANES**, from 5 to 100 tons capacity; (2) **NORTHERN STANDARD or LOW HEADROOM CRANES**, from 1 to 20 tons capacity; and (3) **NORTHERN HOIST CRANES**, from 1 to 15 tons capacity. They combine a higher design factor of safety than is usually specified, with machine tool precision, including: turned and ground shafts—heavy duty roller bearings—oil tight transmission housings—extra heavy girder sections—machine cut steel gears—heavy duty crane type motors, etc., for any span, electrical current, or operating condition. Ask for Catalog ST-712.

NORTHERN ELECTRIC HI-LIFT HOISTS, in models from 2000 to 30,000 lbs. capacity (up to 100 tons in stationary types), provide unusually high hook lift, adding from 12" to 36" to the working height of your building. They operate on standard I-beam, monorail, or tramrail systems. Special hoists also available include: double hook—stationary—bucket hoists; floor or cab controlled; single or variable speed. Ask for Catalog HT-110.

The **NORTHERN TRAVELATOR** is a simple device to convert hand powered cranes to motorized control, to increase operating speed. Your own men can install it in a few hours. Ask for Booklet T-20.

NORTHERN ENGINEERING WORKS—DETROIT, MICHIGAN

HEAVY DUTY CRANES—LOW HEADROOM CRANES—BUCKET CRANES—TRANSFER CRANES—ELECTRIC HOIST CRANES—HAND CRANES—ELECTRIC HOISTS—AIR HOISTS—SPECIAL CRANES AND HOISTS

NORTHERN ENGINEERING WORKS

General Offices: 2625 Atwater St., DETROIT 7, MICH.

BUILDERS OF CRANES AND HOISTS EXCLUSIVELY



GLOBAL LETTER

REVIEW OF WORLD MARKETS

Brazil's metal imports shrinking rapidly as metalworking output expands . . . British labor objects to special bonuses paid to executives . . . Rebuilding Hermann Goering Furnace.

Sao Paulo—National production of iron and steel now includes the manufacture of semifinished steel billets and slabs, structural shapes, bars, bar shapes, foundry pig iron, forging steel, tinplate, sheets, black sheets, hot and cold-rolled strip, and galvanized malleable pipe fittings.

Eight manufacturers are making steel tubes and electrical conduit from strip steel produced at Volta Redonda. Another makes his own steel and has installed American fusion-welding equipment. Still another has a Yoder tube-making machine. Cast and spun iron pipes are also made in Brazil.

Imports Shrinking Fast

The production of steel castings and manganese steel structural shapes, spring products for industrial machinery, ferrosilicon and ferromanganese alloys is increasing rapidly. Imported wire is still used for high quality springs, and die steel is imported for pressings and stampings. The national output of iron and steel wire falls far short of domestic requirements.

Total imports of semifinished

iron and steel products from all sources have dropped from 172,623 tons in 1947 to 46,132 in 1948 and 19,918 during the first half of 1949. Imports of manufactured iron and steel goods decreased from 333,540 tons in 1947 to 211,283 in 1948 and 114,679 during the first 6 months of this year.

Some Imports Curtailed

Imports of chilled wheels for railroad cars have been suspended as national factories claim to be able to fill local requirements. The suspension will be annulled if manufacturers are unable to sell at the landed price of the imported article.

The Federal Council of Foreign Trade is considering the suspension of imports of seamless steel tubing, black and galvanized, on the grounds that this is now being produced in the country by Forjas Nacionaes S. A. and Belgo-Mineira, and that this industry should receive official protection.

Another new metalworking enterprise has been launched in Guarulhos, San Paulo, where Aco Inoxidavel Fabril Guarulhos S. A. has built a plant to produce stainless food containers for use in

hotels, hospitals, mess halls, etc. The plant is equipped with modern machinery, but prices will be high until the factory is able to turn out large quantities in mass production.

British Labor Objects To Special Bonuses to Executives

London—The British trade union council has gone on record with a statement in support of the Labor government's post-devaluation wage policy. It calls on all unions to hold wages at their present levels until January, 1951, when the council suggests the position should be reviewed.

Only one condition is made. If the interim index of retail prices now standing at 112 does not remain between the upper and lower limits of 118 and 106, both sides can resume the normal consideration of wages, and cost-of-living agreements would again operate.

Charge Tax Evasion

In making this policy statement, the council again called the rigorous restraint upon all increases of salaries and dividends, as well as wages. They regard dividends from industrial companies as personal income and stress that they should not be increased while wages are restricted.

They have lately been provided with ammunition by the action of two of the largest motor car companies in paying their managing directors bonuses of \$280,000 for signing an agreement not to work for any other company. Because of the terms of payment, it is as-

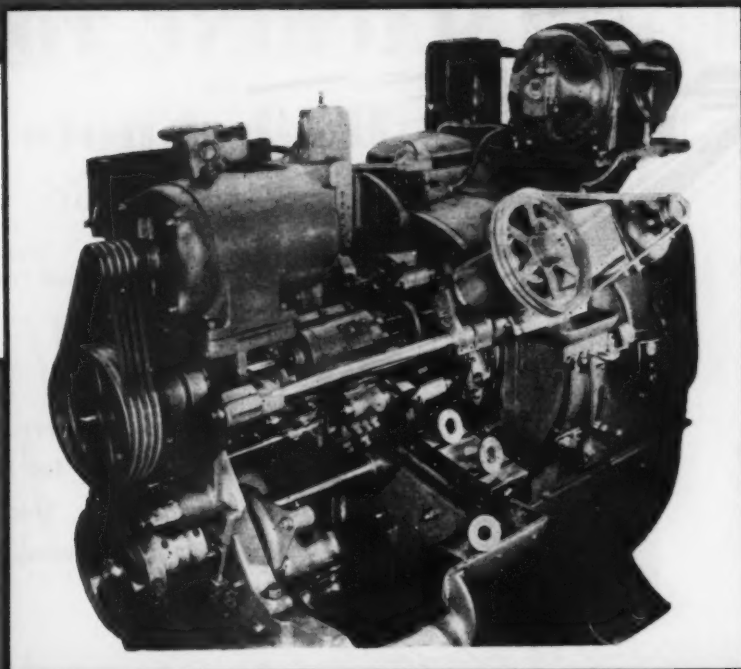
Turn to Page 185

No. 76 H CHUCKER

Has
VERSATILITY

You can combine turning, drilling, tapping, threading, milling, etc., operations.

TRY "Baird" for high production of Automotive Parts requiring finely finished surfaces and close limits.



For Instance:

The picture shows a tool set-up to turn the O.D. and top of a small piston and then cross drill the wristpin hole in the piston in a located position, in one handling and the same machine tooled to turn and then drill the six holes in the cylinder cover plate shown in the picture.

Some of the **EXCLUSIVE FEATURES** which have made the Baird 7 Six-Spindle Horizontal Indexing Lathe outstanding are:

INDEPENDENT TOOL SLIDES

The longitudinal tool slides may have different strokes and the cross slides are independent and have their strokes, all as best suits the job. All tool slides have micrometer adjustment.

DIFFERENT SPEEDS AT SPINDLES

Ability to select a speed for the spindle at each work station to suit the operation to be performed at that station permits the best product in least time.

AUTOMATIC CHUCKING

Operator may work hands free to handle

the work. No levers or handles to require his attention or take his time.

ATTACHMENTS

Several readily applied attachments are available to perform extra operations and reduce handling, thus speeding production.

AUTOMATIC MECHANICAL STOP

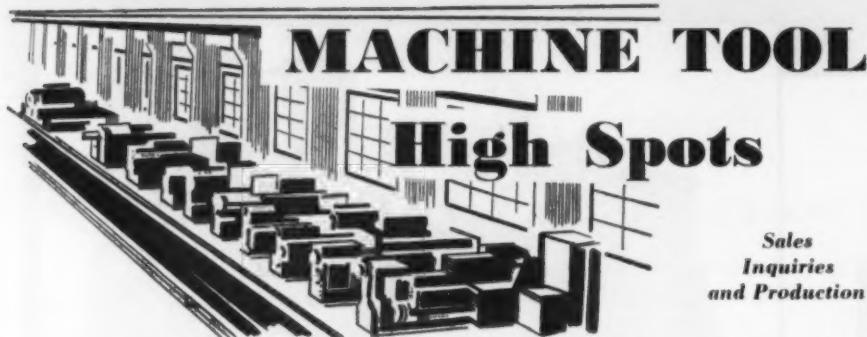
Stops machine at end of each cycle if operator has not unloaded and reloaded in the proper operation of machine. This and other safety features make for least loss due to damage, and for greatest safety.



"ASK BAIRD ABOUT IT"

OTHER BAIRD MACHINES: MULTIPLE SPINDLE GRINDERS, WIRE FORMING MACHINES, PRESSES, TUMBLING EQUIPMENT

THE BAIRD MACHINE COMPANY
STRATFORD, CONN.



Sales
Inquiries
and Production



by

William A. Lloyd

Upturn in foreign orders . . . Foreign customers pay for immediate delivery . . . Studebaker engine changes rumored.

Cleveland—A small but definite upturn in foreign orders was reported this week by spokesmen for major segments of the machine tool industry.

Contrary to the predicted dire effects of devaluation, foreign business is the buoyant factor in some segments of the machine tool industry at the present time. Also, the present modest resurgence developed in what was expected to be the most arid period in the aftermath of devaluation.

Foreign Trade Helps Business

Reason behind the pickup, which has not reached all segments of the industry are not certain, but it is understood that British machine tool deliveries are so far extended in many cases that foreign customers simply decided to pay the difference and get shipment immediately. As a secondary factor, it is believed that a number of prominent foreign customers started tooling programs during the early part of ECA and before, with U. S. machines, and despite the price advantage devaluation has given the British industry, have decided to complete their programs with U. S. machines.

The domestic market is substan-

tially unchanged. Trade sources indicate that the gradual upturn in machine tool orders resumed its slow climb in the latter part of November, following settlement of the steel strike. But business, by the average sales manager's yardstick is spotty.

One district office had more quotations during the past week than during the previous 6 months, with sound indications that the many firms quoted will buy before the year is over. Quotations were requested immediately and the reason given was that they were cleaning up some appropriation money before the end of the year. This was the case in 1948, and the evidence suggests that under present tax laws, this last minute buying could develop into a seasonal pattern.

Inquiries Being Distributed

In Detroit, inquiries are brisk but the volume of new orders is on the slow side, according to machine tool sources. Thanks to a noticeable pickup in recent months, some segments of the industry will exceed their 1948 volume, it is reported. The bulk of dealers and distributors, however, will apparently wind up the year with about

the same sales total or less than in 1948.

There are persistent reports that Studebaker is about to make some important decisions on its new engine program. Some sources believe these decisions will be made within a week or 10 days.

Meanwhile, Willys has joined the parade of car producers who are moving in the direction of high compression engines. In an announcement this week, Willys said the new engine will be available in four and six cylinders and is being readied for the spring production program. There have been rumors in Detroit linking Kaiser-Frazer and Willys-Overland in a possible joint engine development program.

Bridgeport Sales Rise

In Bridgeport, one of the largest electrical equipment dealers in the New England area has reported a sharp pickup in inquiries and sales volume during the past 6 weeks. The dealer, whose sales embrace 50 pct new items and 50 pct rebuilt items, reports that the demand for new units of all descriptions has picked up since the summer and in some cases cannot be immediately supplied. In the case of electric motors, where he could have given immediate delivery this summer, since he had over 250 on hand, he now can only give 12 week delivery.

Industrial Firms Listed

In Washington, among contracts awarded last week by the Navy Dept. was one to Cincinnati Milling & Grinding Machines, Cincinnati, in the amount of \$50,468.

Also in Washington, the Office of Small Business has released a list of industrial firms which the French government has published in its official journal and for which requests may be made for Marshall Plan financing. Commodities listed are for import by private enterprises and the list does not include commodities which may be imported by French government agencies. OSB points out that the release of the list, which includes machine tools, does not necessarily insure the issuance by ECA of procurement authorization for the listed items.

"Only Magnesium-Light is light enough"

You'll hear this said often about Dow

MAGNESIUM

the world's lightest structural metal!



With the value of lightness emphasized by constantly rising costs, operators in the motor transport field want more than just light-weight equipment—they want equipment that is *magnesium-light*. These men who use everything from small panel trucks to huge trailers know that only with magnesium can maximum lightness be achieved.

Magnesium is strong and durable and yet is a full one-third lighter than any other structural metal. This bonus—this premium of one-third greater lightness—makes possible significant weight savings which are immediately reflected in increased payload and decreased operating and maintenance costs. A properly designed magnesium body is frequently 20-25% lighter than the same size body built with other light metals.

This is just one of the fields where magnesium increases efficiency by cutting dead weight to a minimum. It will pay you to investigate magnesium lightness when designing your product. For case studies on successful uses of magnesium, send for "How Magnesium Pays."



**Get maximum weight reduction—
Use Magnesium Extrusions**

Magnesium extrusions can give you significant weight reductions without the loss of needed strength and rigidity. Often, the use of magnesium extrusions tailored to your particular needs will cut manufacturing costs by eliminating the necessity of forming or fabricating from standard shapes. They are competitively priced and available in rods, bars, and tubes as well as structural shapes conforming closely to American Standard Sections.

Lighter Products Sell—make your product Magnesium Light!

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN
New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago • St. Louis • Houston
San Francisco • Los Angeles • Seattle • Dow Chemical of Canada, Limited, Toronto, Canada



December 8, 1949

33

FREE

USE POST CARD

PUBLICATIONS

Face Grinder

New 18-in. wheel face grinder with 24-in. table travel is described in 4-p. catalog through photos, text, and charts. *Abrasive Machine Tool Co.* For more information, check No. 1 on the postcard.

Slow Speed Motors

Slow speed, 1½ hp, 20 rpm, motors for powering agitating and pumping equipment are described in 4-p. catalog and accompanying chart-data sheets. *Sterling Electric Motors.* For more information, check No. 2 on the postcard.

Powder Metallurgy

"Powder Metallurgy Today," new 36-p. booklet presents production applications and suggests future possibilities of the powder metallurgy technique. *F. J. Stokes Machine Co.* For more information, check No. 3 on the postcard.

Electric Blowers

Electric blowers and exhausters are described in bulletin 3014-D, 8 pp. of photos, text, and charts. *Buffalo Forge Co.* For more information, check No. 4 on the postcard.

Countersinking Machine

The Kent No. 200 duplex nut countersinker, capable of processing 120 to 200 nuts per min. is described in 4-p. catalog. *Kent Machine Co.* For more information, check No. 5 on the postcard.

Truck Crane

Truck loading of boxes, barrels, drums, crates, castings, forgings, and other heavy pieces by Ruger 1-

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

ton hydraulic crane is illustrated in 4-p. catalog. *Ruger Equipment Co.* For more information, check No. 6 on the postcard.

AMA Bibliography

"Progress in 7 Fields of Management—1932-1949," a complete bibliography of the publications of the American Management Assn. during the past 18 years on personnel and industrial relations, insurance, marketing, office management, production, finance, and packaging is now available. *American Management Assn.* For more information, check No. 7 on the postcard.

Industrial Lubricants

The line of Keystone specialized lubricants for industrial and automotive machinery is described and illustrated in 30-p. catalog. *Keystone Lubricating Co.* For more information, check No. 8 on the postcard.

Chemical Products

"The Story of the Chemicals You Live by," a new 16-p. booklet describes eight groups of chemical products and lists their industrial applications. *Diamond Alkali Co.* For more information, check No. 9 on the postcard.

Oil Burner

The Hauck industrial oil burner offering push button ignition, automatic control of combustion, and temperature and flame safeguards is described in 24 p. of photos, details and text. *Hauck Mfg. Co.* For more information, check No. 10 on the postcard.

Power Hack Saw

The Jefferson 601 power hacksaw is described and illustrated in 2-p. pamphlet. Specifications and prices are included. *Sales Service Machine Tool Co.* For more information, check No. 11 on the postcard.

Horizontal Machines

Portable horizontal machines for drilling and tapping from practically any location, with machine spindle in almost any position, are described in a new 8-p. catalog. *Bryant Machinery & Engineering Co.* For more information, check No. 12 on the postcard.

Steel Service

New 24-p. brochure tells how to specify and buy alloy steel. The analyses, tests, identifying techniques, and hardenability coding services

Turn to Page 150



Rubber makes a "pipe" dream come true

For years industrial men have been seeking ways to make heavy pipe absorb vibration and wear longer.

Now Hewitt engineers have the answer to this production "pipe" dream . . . a way to reduce replacement costs!

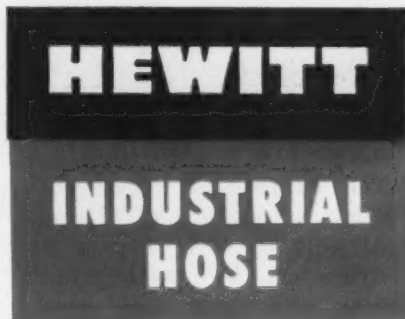
The answer is Hewitt steel-wire-reinforced Flexible Rubber Pipe. This pipe has proved so resistant to harsh abrasive materials that it has doubled and tripled the service life in many installations. What's more, it often costs no more to begin with!

This versatile pipe is being used to carry gritty, abrasive materials in ash disposal systems at power plants . . . high phosphate-content material as well as strong acid and alkali solutions at chemical plants . . . slurries in coal and metal mines . . . and for many other solids-in-solution handling jobs.

H-R Flexible Rubber Pipe is easy to handle and couple. You can curve it and flex it, thus often eliminating costly elbows.

It can be made to resist abrasive actions, to withstand oils, and to stand up against the acids and chemicals that normally attack other materials. And, of course, it won't rust.

For full information on how Hewitt Flexible Rubber Pipe can be applied to your own needs, phone the Hewitt Distributor listed in the classified section of your phone book. Or write direct to Hewitt Rubber Division, 240 Kensington Ave., Buffalo 5, N.Y.



HEWITT RUBBER DIVISION

HEWITT-ROBINS



INCORPORATED

Hewitt-Robins Products for Industry

Hewitt Rubber Division

Conveyor Belting • Elevator Belting • Hot Materials Belting • Transmission Belting • Air Hose • Welding Hose • Steam Hose • Water Hose • Fire Hose • Sand Blast Hose • Suction Hose • Acid Hose • Gasoline Hose • Chemical Hose • Rubberlokt Rotary Wire Brushes

Robins Conveyors Division

Screens • Screen Cloth • Shakeouts • Conveyors • Idlers • Car Shakeouts • Dewaterizers

Robins Engineers

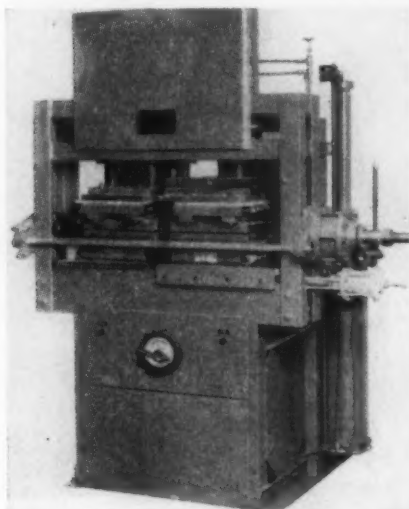
Design and construction of complete bulk materials handling systems.

NEW

PRODUCTION IDEAS

Continued

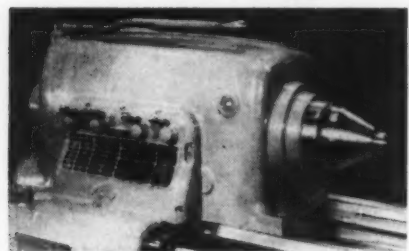
the upset on the heated part. Up to 30,000 lb pressure can be exerted automatically when the stock has reached the desired temperature, or pressure can be thrown on when the stock starts to heat. When the proper temperature has been reached and the upset completed,



the hydraulic pressure is automatically cut off and an air cylinder draws back the movable electrodes so that the completed piece can be removed and a new piece inserted. Stock lengths from a few inches up to 36 in. may be compressed in the unit; power input varies from 30 to 120 kva; and the operating cycle ranges from 8 to 50 sec. *Frank C. Cheston Co. For more information, check No. 33 on the postcard on p. 35.*

Collet Attachment

A new lever-operated collet attachment provides up to 1 1/8 in. round bar stock capacity for appli-

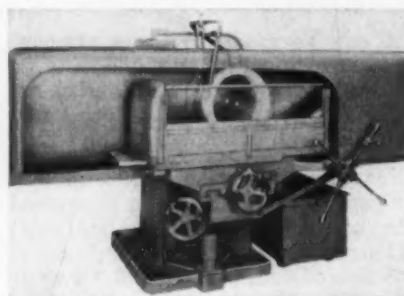


cation on all Monarch Series 60 engine and toolroom lathes. Installa-

tion on the machine is at the factory only. The attachment can be used for either draw-in or pusher-type collets, both types being identical except for the drawbar, collets and spindle nose adapter. Removal of the drawbar is easily accomplished when the collet attachment is in use. The relation between the attachment and the collet itself can be adjusted readily from the exterior of the machine. *Monarch Machine Tool Co. For more information, check No. 34 on the postcard on p. 35.*

Face Grinder

A new face grinder features a 15 hp, 900 rpm motorized spindle and 18-in. wheel. Pulleys and belts are eliminated. The spindle is mounted on pre-loaded ball bearings to insure long life and chatter-free operation. Box-type ways give maximum rigidity. The large work surface 13 x 36 in. permits almost every face grinding application



where flat, square surfaces are required. Coolant equipment has a 60-gal tank and unique table waterguards. *Abrasive Machine Tool Co. For more information, check No. 35 on the postcard on p. 35.*

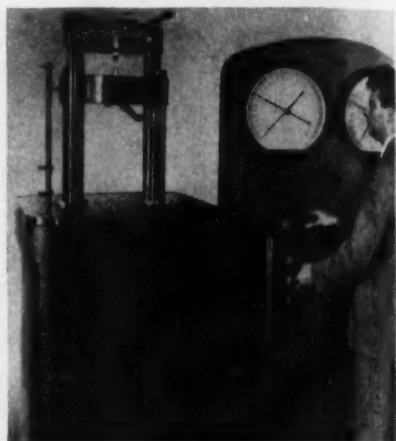
Oxyacetylene Outfit

The Flamecraft oxyacetylene welding and cutting outfit is a packaged unit including oxygen and acetylene cylinders, welding torch, cutting attachment, tips, regulators, hose, goggles, cylinder truck, fluxes, an assortment of welding and hardfacing rods and an instruction folder. Cylinders are 60 ft acetylene and 122-ft oxygen sup-

plied with the outfit on a 25-year lease basis. *Air Reduction Sales Co. For more information, check No. 36 on the postcard on p. 35.*

Testing Machine

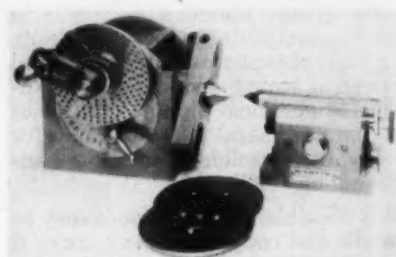
An improved, low-cost universal testing machine with 60,000-lb range graduated into 100-lb units, and 12,000-lb range graduated into 20-lb units has a hydraulic loading unit separate from the indicating and control unit. The recoil from breaking specimens is isolated and



maximum or lazy hands can be adjusted with minimum drag. Vertical distance between gripping heads may be 1 to 18 in., the latter including the stroke. Clear lateral space between columns is 10 in. Push buttons control the motor-driven lower gripping head that has a range of 17 in. at 10 ipm. *Baldwin Locomotive Works. For more information, check No. 37 on the postcard on p. 35.*

Dividing Head

For dividing operations required in gear cutting, layout, splines, fluting taps or reamers, cams, hex screws and squaring shafts a new



dividing head provides wide latitude in selecting various divisions to meet specific requirements. The unit has three index plates, each

Turn to Page 153

POTTER & JOHNSTON

3U SPEED-FLEX FULLY AUTOMATIC TURRET LATHE

**PAYS OFF
3 WAYS**

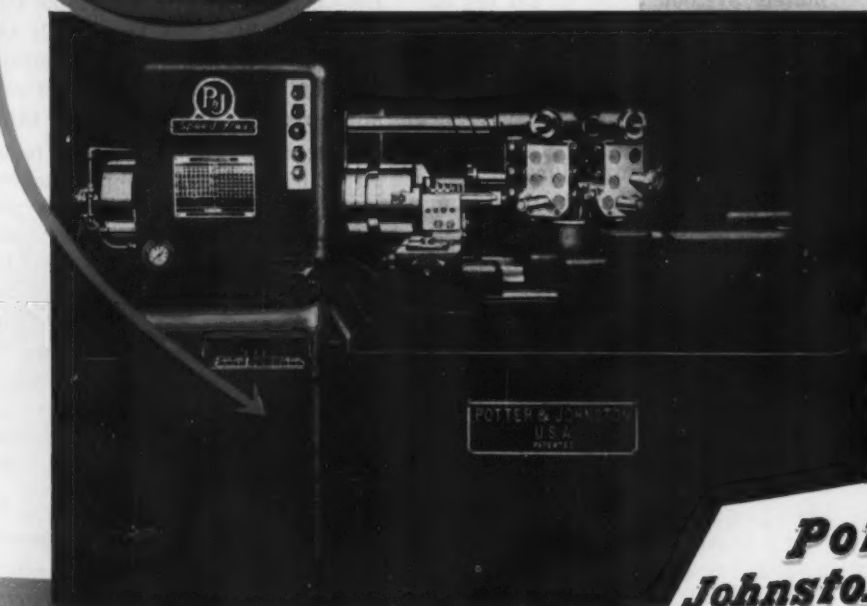
**INGENIOUS DOG DRUM
PROVIDES PRECISION
CONTROL OF TURRET
TOOLS TO ATTAIN
MAXIMUM PRODUCTIVITY
WITH ECONOMY**

Adjustable Dogs on Drum pictured at the left provide complete flexibility, and positive, fully automatic control of turret slide action in direct relation to spindle speeds — to meet all machining requirements, however intricate, at all turret positions. Details: Dogs are easily adjusted to select any of 4 spindle speeds . . . select any of 3 turret slide feeds . . . actuate turret slide feed . . . actuate turret slide rapid traverse . . . stop turret slide . . . stop spindle.

- 1** Fewer Rejects — accompanied by better work and more of it.
- 2** Increased Productivity — combining cuts, reducing machining times, eliminating unnecessary work handling.
- 3** Greater Economy — in tool life, tooling costs, operating costs, labor costs.

P&J-engineered Tooling on the P&J 3U Speed-Flex is the most direct way to attain maximum Productivity-with-Economy on high speed, multiple-operation work up to 6" in diameter. Get a P&J estimate on any job in this class — and compare. You'll find that P&J's 50 years' experience in this field of production metal-working pays off.

Send sample parts or prints for P&J Tooling recommendation and estimate, and ask for your copy of the 3U Speed-Flex Bulletin.



PRECISION + PRODUCTIVITY = ECONOMY
on work up to 6" diameter on the
3U SPEED-FLEX AUTOMATIC

**Potter &
Johnston Company**

Pawtucket, R. I.
subsidiary of Pratt & Whitney
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On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

**Attempts at calculating car inventories from factory sales and registration data are hazardous at best
... Cadillac produces its millionth car.**



by

Walter G. Patten

Detroit—No one knows exactly how many passenger cars and trucks have been produced and remain unsold. A lot of people, including the trade press, investment bankers and others have devised "formulas" which they feel enables them to estimate with reasonable accuracy the inventory of unsold automobiles.

In a letter received from a reader this week it is pointed out that it can be "proven" statistically that the float of "cars" between the assembly line and the retail customer is about 600,000 as of Aug. 31. This is equivalent to 7 weeks' supply. Admitting the estimate may be wide of the mark, the reader asks us to explain what is wrong with the derivation.

As set forth in the letter, the formula used is probably more involved than many of the methods

used by others. Assuming there were no cars in inventory at the close of 1944, it is deduced from registrations between 1942 and 1944 and the number of cars shipped that the inventory at the close of 1941 must have been approximately 450,000.

Careful Estimates Made

This reader has also noted that between 1934 and 1941 approximately 371,000 units or 1.6 pct of all cars sold at retail were not registered. Application of the 1.6 pct to postwar shipments and registrations indicate an inventory of 605,000 as of Aug. 31, 1949.

After careful investigation, this reporter believes that the maximum float of new passenger cars and trucks today is no more than 450,000. The actual inventory, if it could be obtained, would probably be less than 400,000 units. This figure includes cars and trucks in transit, company cars, dealer demonstrators and other vehicles necessary to carry on the automobile business as well as units remaining unsold on the dealer's floor.

If it is assumed that 40 pct of cars built and unsold are included in the factory and dealer "float," this leaves about 240,000 cars or six vehicles per dealer available for sale to the public. To put it another way, total units in dealers' hands, plus cars and trucks enroute to dealers, may average 10 per dealer.

According to automotive distribution experts, a minimum of 12 cars per dealer was not uncommon in 1941 and at some seasons of the year the total was substantially above this.

Sources of Error Exist

There are two potential sources of error in any attempted calculation of automobile stocks: (1) There will always be an important time lag which is both variable and unpredictable; (2) there will always be a variable and substantial number of cars produced that are never registered as passenger cars.

New car registrations are regularly 30 to 50 days behind factory sales. The lag is particularly noticeable in some of the southern states that are poorly organized to compile new passenger car data. The time lag factor may vary between manufacturers. It is apt to be shorter at the end of the year, particularly if a car producer is anxious to register the maximum number of cars in order to outdistance a competitor.

Shipments Exceed Registrations

Auto executives who have studied registrations have noted a definite seasonal pattern. At the start of the year, registrations of new cars usually lag 15 pct behind factory sales. By the end of the year the lag may be down to about 5 pct.

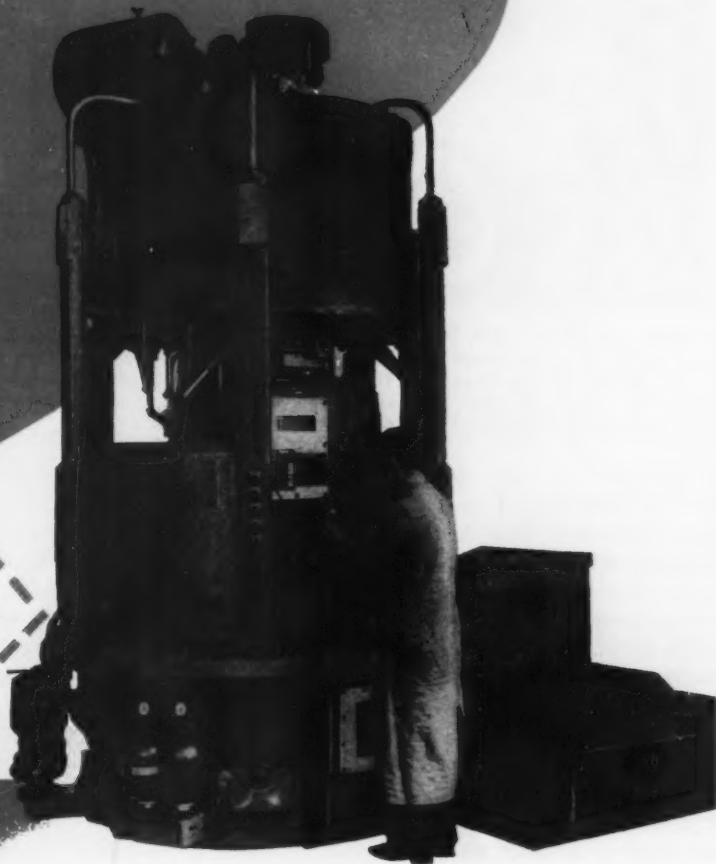
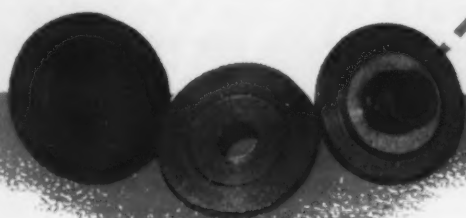
Our reader has pointed out that

it's the faster **BULLARD** 12 SPINDLE TYPE "K" **MULT-AU-MATIC**

*Twin Spindle Application
High Spindle Speeds
Less time for the Index Cycle*

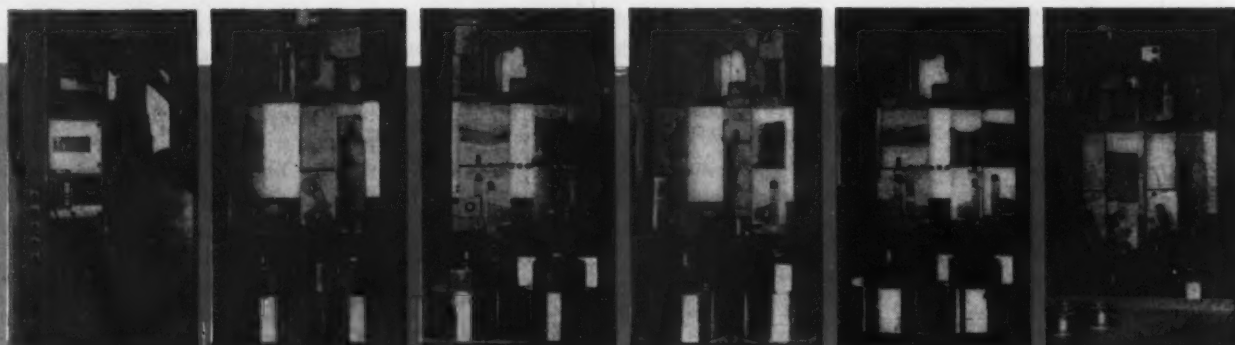
Each of these characteristics contribute to increased Production and Lower cost of small and medium sized jobs in cast iron, steel and light metal alloys.

Turbine Hub steel forging —
1st and 2nd chucking
98 pieces per hour at 85% efficiency



Setting The Pace for Manufacturing Economies

There are 19 operations combined in the 1st and 2nd chuckings. Each index of the machine delivers a finished piece. When writing for information refer to ad XK



STATION 1

STATION 2

STATION 3

STATION 4

STATION 5

STATION 6

THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT



NOW WORKING ON THEIR SECOND MILLION: On Nov. 25 Cadillac Div. of General Motors produced its millionth car. Cadillac has been producing cars in the high-priced field for 48 years. "The second million should come a lot easier," according to John F. Gordon, general manager (left) shown here with Don E. Ahrens, general sales manager and C. A. Rafferty, works manager.

from Jan. 1 to Aug. 31, 1949, domestic shipments of passenger cars have exceeded new car registrations by 6.8 pct. Here are some of many ways in which new cars may escape registration: (1) Government units, including federal, state and even local city fleets; (2) dealer demonstrators; (3) new cars held for service by dealers; (4) ambulances and hearses produced as passenger cars but registered as trucks; (5) taxicabs may not be reported originally as commercial cars by the factory; (6) cars bought by large farm interests for off-the-highway use; (7) military vehicles; (8) cars wrecked in transit or sold by an owner to a foreign buyer.

The point seems to be well taken that calculations of passenger car inventories from registration figures are hazardous at best and may lead to entirely erroneous conclusions about new car inventories in dealers' hands.

Reveals Auto Expert's Hobby

Automobile engineers often ride strange hobbies. Take the well-known automotive expert who invents gadgets for cutting his own hair. He's been successful enough at it, we learn, so that he hasn't had to patronize a barber shop for 2 years.

Some pretty original thinking was required to develop a workable scissors-and-comb combination. The comb is held in place by means of a clip attached to one of the blades.

The tang of the comb fits into a spring pocket and can be transferred from one side of the scissors blade to the other. The blade holding the comb remains stationary during the cutting stroke.

"Some skill must be developed to use the device," we are told, "but it works very successfully after a little preliminary instruction and practice." Anybody who prides himself in having skill in his hands can learn to use it, we are assured. At the present time the device is not being manufactured for sale to the public.

Transmission Prices Reduced

The price of automatic transmissions has been sharply reduced.

Following announcements of a price cut by Oldsmobile and a comparable price adjustment by Cadillac, Nash has announced a reduction of \$26.50 in the retail price of its Hydra-Matic drive on 1950 Nash models. Buick has made an even steeper reduction in the cost of its Dynaflo transmission which has been reduced \$40, equivalent to 20 pct of the retail price.

The recent price reduction brings the cost of Dynaflo to \$160 compared with \$158.50 for the Nash-equipped Hydra-Matic.

Buick has announced the production of more than 262,000 Dynaflo units during 1949. This is the largest sale of automatic transmissions by any single car manufacturer, Buick said. Ap-

proximately 71 pct of 370,000 cars built by Buick this year have been equipped with Dynaflo transmissions.

Cadillac Celebration Marks Completion of Its Millionth Car

Just prior to changing over to 1950 models, Cadillac completed its millionth car. This is quite an achievement in the fine car field. During an appropriate celebration at the Detroit Athletic Club last week, John F. Gordon, general manager of Cadillac, reviewed some of the milestones in Cadillac's history. The company was established in 1902. Cadillac was the first automobile producer to change from one-cylinder to a four-cylinder engine. This was in 1905. In 1914 Cadillac introduced the first V-8 engine. Cadillac also pioneered, according to Mr. Gordon, interchangeability of parts, the electric starter, electric lighting and the closed body. Other Cadillac claims to distinction are the Syncro-Mesh transmission, knee action, and no-draft ventilation.



Mr. Gordon emphasized a Cadillac achievement which has practically escaped public notice. Fifteen years ago, he said, the average price of a Cadillac was more than 4½ times that of the average price of cars sold in the industry. At the present time, the Cadillac price is only 1.6 times the average price of other cars.

In the 1949 model year, Cadillac built 92,554 units, an increase of 39 pct over any previous model year.

D. E. Ahrens disclosed the number of Cadillac cars in dealers' hands, including those at the factory and in transit, totaled about 9100. This is an average of less than six cars per dealer. In some models, Mr. Ahrens pointed out, the dealers are entirely out of cars.

The Cadillac plant is tooled to produce cars at an hourly rate 25 pct greater than last year. This is the potential gain that is possible. Availability of materials and the conditions of the market will naturally determine whether Cadillac produces at the maximum rate throughout the entire year.

The 1950 Cadillacs will be introduced in New York on Jan. 17.



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December 8, 1949

WEST COAST PROGRESS REPORT



California tackles unemployment as population growth outraces the expansion of industry . . . Aluminum sales prospects.

San Francisco—Unemployment—that spectre lurking in the background of this area where population growth has increased at even a greater rate than the rapidly expanding industrial economy—is being given thorough study this week by about 2000 business leaders at Sacramento under the watchful eye of Governor Earl Warren.

Faced With Serious Problems

There are approximately 4½ million employable persons in the state and latest available figures show that approximately 350,000, or almost 8 pct were out job hunting. The month of October saw a drop of 17,300 in manufacturing employment alone which reflects steel strike unemployment. Construction employment in September was about 4 pct below the same month last year. While the unemployment situation has not developed to the point of extreme seriousness, it is the intention of the Governor to have every possible means of increasing payrolls explored and to ascertain ways and means of developing new industries.

Digest of Far West Industrial Activity



by

J. Reinhardt

It is understandable that foundrymen and steel producers, particularly from the Los Angeles area who have been invited to attend this conference, are a little perplexed. These industrialists today are faced with a serious problem of spending considerable sums for the control of smoke and fumes from their operations to comply with regulations of the Los Angeles Air Pollution Control District and, as one of them said, "On the one hand we are being urged to do all possible to increase employment and on the other are faced with controls which actually threaten our continued operations."

In this connection Dr. A. M.

Zarem, youthful director of the Los Angeles Div. of the Stanford Research Institute, told the industrial section of the California State Chamber of Commerce in a meeting last week, "Because the future development of the West requires the existence of stable, diversified industries, the problems which come from living close to industry are of increasing concern to all."

Air Pollution Being Studied

Dr. Zarem pointed out the importance of water and air to the continued industrial growth of the area and that both involved the matter of pollution. He said, "As our cities become more crowded, quantity and quality of our water supply becomes more critical, and as industrial development proceeds, factors of air pollution and water pollution gain in significance. This obviously must influence the choice of industrial plant locations.

California, which has taken the lead in applying a scientific approach to the air pollution problem for example, is being watched carefully by both existing industries and industries contemplating locating in the state. There is serious need for alerting both the public and industry to their social and economic obligation and responsibilities with regard to the contaminations due to human activity. Past experience has indicated that such problems are not solved by more laws or more rigid laws and what progress has been made has been the result of efforts of informed officials who have utilized their energies and wisdom in cooperation with industries and municipalities. Such ac-

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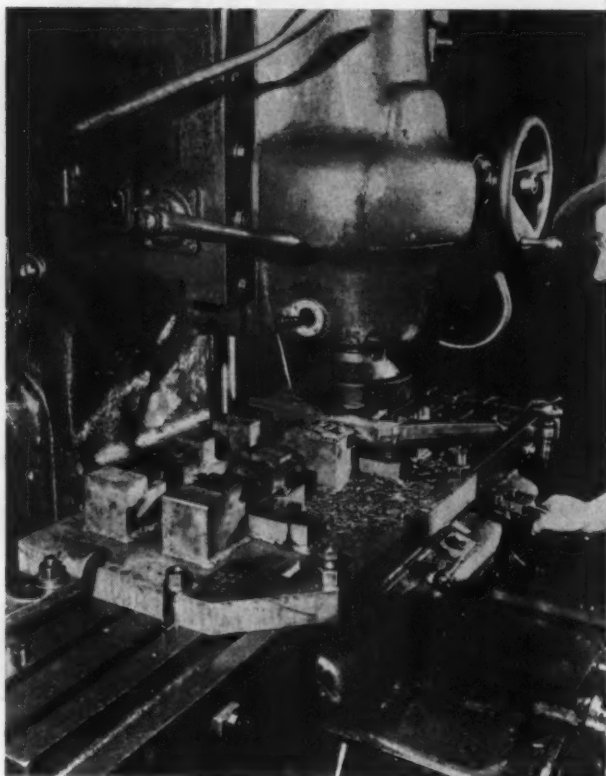
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STRATOJET FIXTURE: A first operation hyper mill fixture for milling wing stiffener fittings for the Boeing B-47 Stratojet is proofed on a vertical mill at Texas Engineering & Mfg. Co., Inc., Dallas, prior to delivery to Boeing Aircraft Corp. at Wichita, Kan. The fixture checked out at a tolerance of 0.0005 in., or ten times better than the 0.005 in. tolerance called for in the specification.

tion coupled with intelligent aggressive research to develop and reveal technological improvements in industrial processes finally will meet the problem," he concluded.

Industrial Expansion Continues

Indicative of the growth Dr. Zarem referred to is the report that eight new factories and expansion of 18 others in Los Angeles County took place during the month of October involving an investment of approximately \$3 million and affording jobs for 480 industrial workers. Manufacturing growth of the county from January through October made work for 8400 additional men and women. Total capital investments in new and expanded industries in the county of the first 10 months of this year amounted to more than \$83 million which was an increase of 31 pct over the same period last year.

In the San Francisco Bay Region and northern California 49 projects involving new plants or expansions brought about an investment of approximately \$15 million in October.

Aluminum Sales Outlook Better; May Restore Power Cut

Seattle—Outlook for sales of aluminum sheets for 1950 are far brighter than they have been for the past 2 years according to producers and distributors in this area. Although inventories apparently now are fairly high, orders are coming in with instructions to ship soon after the first of the year in sufficient quantity to create a considerable feeling of optimism. Fourth quarter buying is high with considerable tonnages having gone into the grain storage program.

The recent wind and rain storm that hit the Pacific Northwest causing considerable damage had at least one favorable aspect. The increased flow of rivers providing the power used by the aluminum industry may be sufficient to influence the Bonneville Power Administration to lift power curtailments on the industry. The situation has improved so much within the past week that BPA may be able to restore the 70,000 kw

taken from the reduction plants late in October.

Final decision on this action will depend, according to the district manager, on how much of the rainfall was absorbed by the ground and whether this reservoir is sufficient to maintain a high stream flow. Columbia River flow at Grand Coulee was increased from 41,000 to 47,000 sec ft and at Bonneville from 90,000 to 114,000 sec ft with all storage reservoirs filled except that at Ross Dam where impounded water was raised 13 ft. With restoration of this power it may be possible for the sixth pot line at Mead of the Kaiser Aluminum & Chemical Corp.'s plant to get back into operation.

Geneva Structural Mill Resumes Limited Operations

Salt Lake City—Geneva Steel Co.'s structural mill, down since last June because of a dearth of orders for structural shapes, will resume operations on a limited basis Dec. 5, Dr. Walther Mathesius, president, announces.

Sufficient orders have accumulated during the shutdown, according to Dr. Mathesius, to justify the establishment of rolling schedules for one turn per day 5 days a week. How long the schedule continues will depend upon the demand for shapes.

Most of the approximately 85 men required in the structural mill will be transferred from other departments of the plant which absorbed them at the time of the shutdown.

Receives Aircraft Business

Los Angeles—AiResearch Mfg. Co. has received since Oct. 1 alone new production orders for \$2,500,000 worth of aircraft accessories. The new business comes from approximately 40 different customers, including the military services and is for 52 types of aircraft.

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THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

Federal Trade Commission may act on the steel industry's offer to end price-fixing charges . . . Military aid shipments to begin shortly . . . Disproves monopoly charges.



by

Eugene J. Hardy

Washington — It will probably be mid-January, at the earliest, before the Federal Trade Commission decides to approve or reject the steel industry's offer to accept a consent order designed to end the price-fixing charges filed by the FTC in August 1947.

Urges Rejection of Offer

The proposal, signed by the American Iron & Steel Institute and all steel companies charged by FTC while dated Oct. 15, was not formally presented to the commissioners until Dec. 1. It was accompanied by a memorandum urging its acceptance, from Lynn C. Paulson, Assistant Chief Trial Counsel in charge of this case. Mr. Paulson in two key statements told the commission that acceptance of the proposal would "permanently enjoin" the steel industry "from using the basing point delivered price system," but "it will permit sellers to absorb freight competitively within the law."

A possible fly-in-the-ointment, however, was another accompanying memorandum from Richard P. Whiteley, Chief Trial Counsel and Mr. Paulson's superior, which

urged the commission to reject the steel industry's offer. He said that the commission did not have the authority to dispose of the case on this basis without complete findings as to the facts supported by evidence, and that, in any event, such disposition would be contrary to the public interest. As an alternative, Mr. Whiteley suggests that the industry plead "no contest" which would permit the commission to file findings and an order without any admission as to the facts on the part of the industry.

Decision Will Be Delayed

While conceding that the proposed order does not make any real admissions as to the allegations in the complaint, Mr. Paulson contends that the commission does have the authority to proceed in this manner and that it would be in the public interest due to the confusion that has surrounded the legality of delivered prices and freight absorption ever since the Cement decision emanated from the Supreme Court.

The decision is likely to be delayed for the following reasons:

(1) Two of the four commissioners are relatively new in their posts and will need time to study the problem; and (2) the commission is short one member and would prefer to have the vacancy filled before deciding such a major issue, which would probably end the entire basing point controversy. There are also reports that if a vote were taken now the commission would split 2-2 on acceptance of the steel industry proposal.

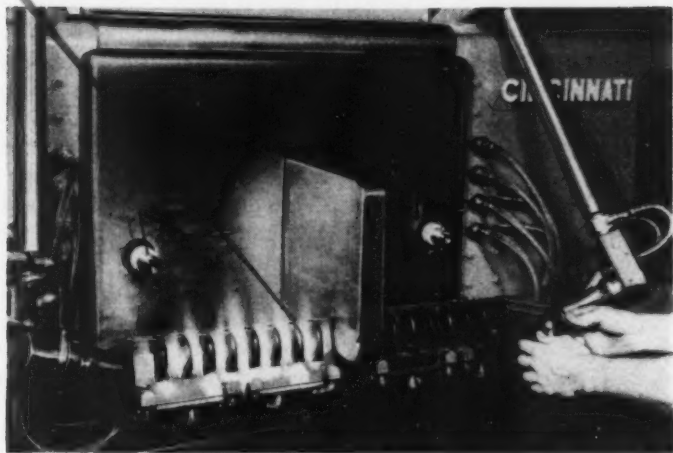
The final proposed order offered by the industry contains little that is startlingly new. In fact, it is much the same as the proposed order suggested by Mr. Paulson almost 2 years ago and published exclusively in *THE IRON AGE* (Feb. 26, 1948, p. 104). It would require the steel industry to: (1) Establish a plant price at every mill and sell f.o.b. mill when requested; (2) cease the compilation and dissemination of freight rate information; and (3) refrain from agreement on extra charges.

An added provision spells out permission to absorb freight unless the effect is to "lessen competition unlawfully." Another provi-

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This unique dual burner Flamatic setup for hardening Ridge Tool pipe wrench jaws is an example. Operator loads eight parts on burner assembly and presses button. During heating cycle on one burner, operator loads the other. Determine now if Flamatic surface hardening can help make your product better, for less money. Send a part print for analysis and write for "fh," the new booklet of Flamatic case histories.



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sion would not limit the steel industry to the course of action outlined in the proposed order if Congress enacts any law relating to the subject matter of the order.

Will Begin Shipments Of Military Items to NAPC

Shipment of military items to the North Atlantic Pact Countries and others covered by the Mutual Defense Assistance Program will begin shortly after Jan. 1. The Defense Committee of the North Atlantic Pact nations meeting in Paris has approved general recommendations, thus clearing the last major obstacle. With Presidential approval of the recommendations, expected shortly, the \$1 billion aid program can get into full swing. Signing of bi-lateral agreements with the various countries will be largely a matter of form. Another hold-up which is slowly being straightened out involves the determination of the exact requirements of the various countries.

While shipments are scheduled to get under way within a few weeks, initially they will be entirely from surplus and reserve military stocks. All new procure-

ment for military items will be handled under existing procedures of the three defense departments, Army, Navy, and Air Force. The Munitions Board is acting as the coordinating agency just as it does for regular procurement for the U. S. armed forces. Munitions Board officers told THE IRON AGE that it will be well into March or April before contracts begin flowing into the hands of industry.

Most of the contracts will not be recognizable as being for foreign aid purposes, since they will be integrated with normal military procurement. Firms interested in obtaining some of this business are advised to keep in contact with existing military supply offices.

However, in the case of the \$100 million which has been tentatively set aside for the procurement of machine tools and other production equipment and raw materials to boost arms output in Europe, actual buying may get under way much earlier. The reason for this is that these materials will be purchased under procedures of the Economic Cooperation Administration. ECA states that it will be able to integrate this with its program of economic foreign aid.

Evidence Disproves That Monopolies Dominate Industry

Fact that the calamity-howlers who foresee American industry dominated by monopolies just don't know what they're talking about is now being demonstrated on Capitol Hill.

Recent evidence presented to a Congressional committee by representatives of many industries serves to point up what every businessman has known all his life; as long as sellers have to compete with one another for the favor of the buyer, competition (1) within industries and (2) between industries will continue to sparkplug the free-enterprise system. Among the businessmen who clearly demonstrated this economic principle were Charles E. Wilson, president of General Electric Co., Crawford E. Greenwalt, president, Du Pont Co., and Herman W. Steinkraus, president, U. S. Chamber of Commerce.

But too many congressmen are ignorant of this truism. For example, Representative Celler, D., N. Y., and his antimonopoly investigating group in the House of Representatives have been loudly lamenting in recent weeks that the American economy is headed for monopolistic control by a few basic industries.

However, some of the facts of business life may be coming to the attention of the White House, which had earlier supported Mr. Celler's blunderbuss technique. Indications are that the Administration policy of "shoot first and ask questions later" may be toned down. Definite signs may be read from the President's go-ahead signal to Commerce Secretary Sawyer for setting up an inter-agency educational program which not only makes clear to business what is fair and unfair and where business expansion crosses the line into monopoly but to coordinate the government's own enforcement activities. This may be a concession to Mr. Sawyer's own belief that business is basically honest if it knows what to do. It may partly result from unfavorable public reaction to the suit to break up A&P."

THE BULL OF THE WOODS

By J. R. Williams



A PRACTICAL EVALUATION OF Ductile Cast Iron



By T. E. EAGAN,
Chief Metallurgist,



and J. D. JAMES,
Foundry Superintendent,
Cooper-Bessemer Corp.,
Grove City, Pa.

SUMMARY: A practical evaluation of ductile iron, based on a series of tests involving full size castings, is presented in this interim report of extensive investigation of this new material being conducted by Cooper-Bessemer Corp. In this first part of a two-part article, the authors cover foundry practice, mass effect, heat treatment and impact strength.

SINCE the announcement by International Nickel Co.¹ that treating cast iron with magnesium alloys would produce spheroidization of the graphite and result in a ductile cast iron of superior strength, a number of articles have been published on the subject.

None of these articles have contained any extensive results obtained from castings made under actual foundry conditions. They have

covered accomplishments obtained mainly in the laboratory.

The evaluation of this material needs more definite information on what can be obtained in castings made under foundry conditions.

The Cooper-Bessemer Corp., being the first licensee of International Nickel Co.,² has proceeded with its development with the specific goal in mind of using this type of cast iron in

compressors and in diesel and gas engines. Most castings in which Cooper-Bessemer is interested are large and have rather heavy sections. Hence, experimental work has been pointed to the development of this type of material for these sections.

During the past 10 years the demand for compressors designed to operate safely at continuous discharge pressures in excess of 1000 psi has increased rapidly in response to growth in recycling, pressure maintenance, and gas storage operations. To meet this demand, the manufacturer has been using cast, forged, or welded steel construction at 50 to 100 pct increase in cost both to him and to the ultimate user.

The main trend has been to make these component parts of cast steel. Cast steel has proven to be relatively unsatisfactory because of the intricate design, in that foundries have been unable to produce successfully castings that are free of internal flaws. In consequence, considerable repair welding has to be done. In many cases this repair welding has been in areas where it could not be tolerated and the casting has been a total loss to all concerned.

This statement is in no way to be construed to mean that the authors are condemning steel castings in general. The design required for the parts simply does not readily lend itself to being cast in steel.

Ductile cast iron, because of its castability, which the authors have found to be as good as

gray iron, seemed the logical solution for a number of these compressor parts. Before using it, however, it was necessary that the material be carefully studied from all angles.

This present report covers the investigation up to the present time and should be considered as an interim report because as yet ductile cast iron has not been adopted for the parts. More work must be done.

Foundry Properties

It has been proved to our own satisfaction that, using cupola iron, it is practical to produce iron with the graphite in the spheroidal form. However, it is necessary that iron be melted with close control and that the ladle additions of the magnesium alloy be carefully calculated and added in specified ways to obtain the best results.

The control over the amount of magnesium in the iron is very important especially in castings having heavy sections or sections that are slowly cooled due to being deeply buried in sand. Control over the other elements in the iron is also necessary and will be discussed later. It is the authors' candid opinion that ductile cast iron is not one to be tackled by foundries which do not have excellent control over their melting procedure.

The metal lends itself to normal gray iron foundry practice as far as molding is concerned. It apparently works best with dry sand practice, especially in heavy sections. Its flowability is equal to or better than the base metal not treated with magnesium. Its liquid shrinkage is greater than the base iron from which it is made and adequate feeding must be supplied to insure a sound casting.

The hazards involved in adding magnesium in

¹ See THE IRON AGE, May 20, 1948, p. 82.
² Under U. S. Patents Nos. 2,485,760 and 2,485,761.

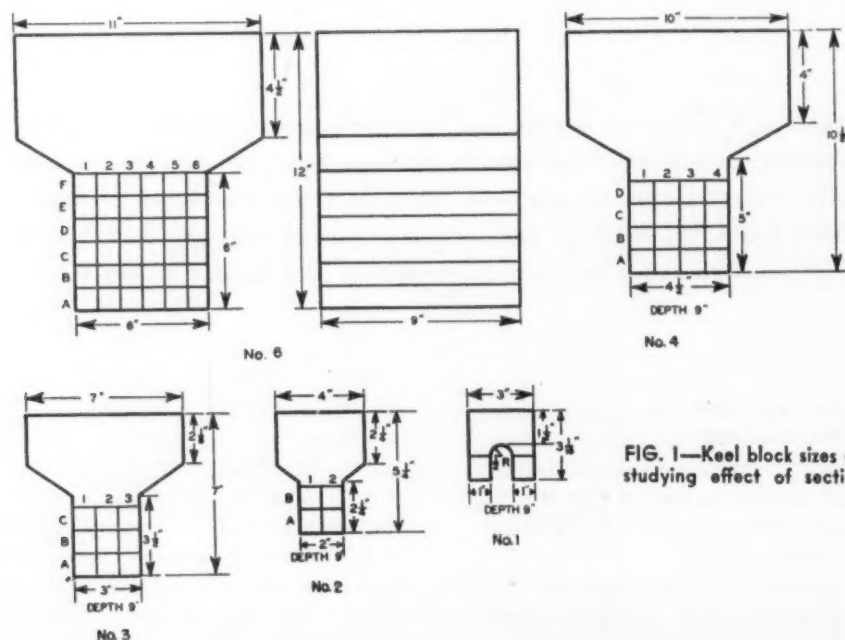


FIG. 1—Keel block sizes used for studying effect of section size.

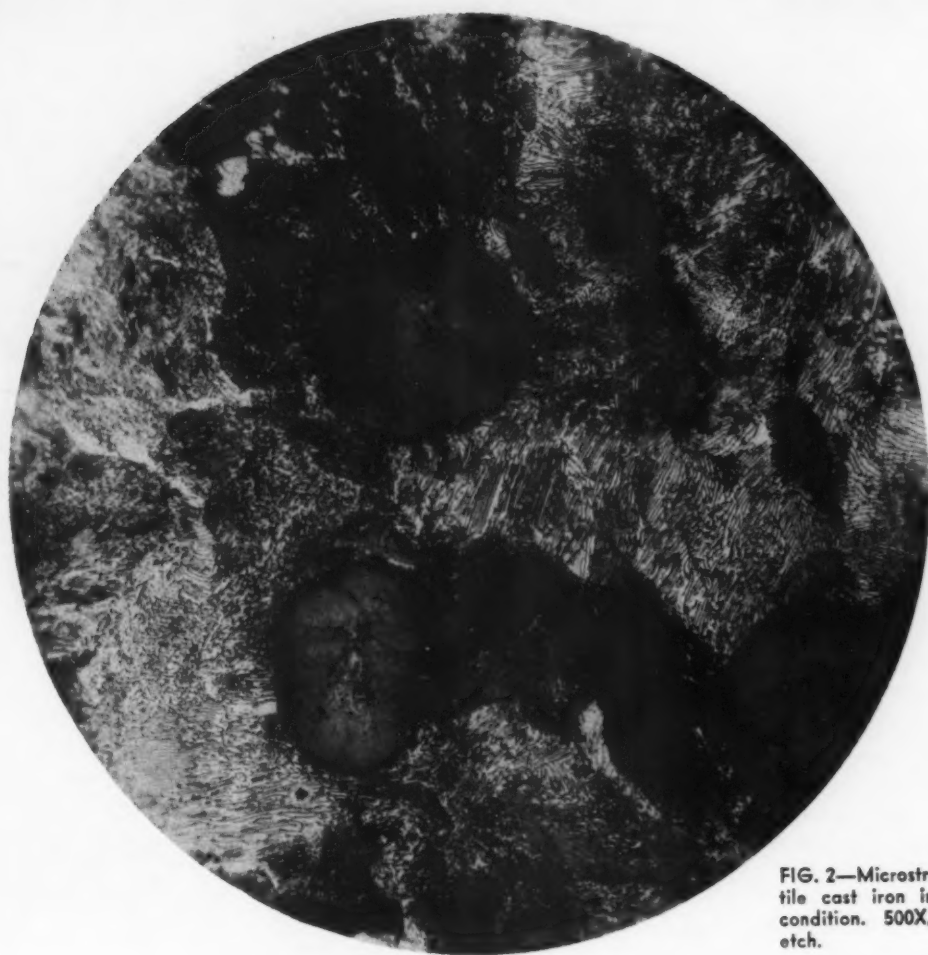


FIG. 2—Microstructure of ductile cast iron in the as-cast condition. 500X, 5 pct nital etch.

the form of the alloys currently supplied by International Nickel Co. are not serious. No metal is blown out of the mold. The only precaution necessary is to protect the eyes from the bright, characteristic flash of magnesium, should there be any.

Not all heats made by Cooper-Bessemer have been 100 pct spheroidal graphite. Some have been fully flake graphite and others have been a mixture of spheroidal and flake especially in the heavier sections. The explanation of some of these failures could be easily ascertained, and was usually due to insufficient magnesium. The results given in this report, unless otherwise noted, are those obtained with material which had over 95 pct spheroidal graphite, even in the heavier sections.

In studying the physical properties obtainable in ductile cast iron for heavy sections, it became advisable to select some standard set of test specimens. Standard ASTM arbitration bars are not satisfactory because of centerline shrinkage. However, the standard 1-in. keel block has been used very successfully to assure sound specimens. Consequently this, and more or less standard modifications of varying section thicknesses, as shown in fig. 1, were adopted.

These specimens were arranged so that all

sizes could be cast in one flask. A set was cast for almost all heats with the exception of a few where sufficient metal was not available. In these cases only the 1-in. keel block was cast. The specimens were cast in dry sand molds.

The material under the riser was used for test, and all tests were taken from a slice 1 in. up from the bottom in position B (fig. 1), except the 1-in. block. Exploratory tests were taken in a number of cases across the section, but in those cases where this was not done, the position 1-in. from the edge was taken. The blocks were sufficiently long to also obtain impact tests.

Standard 0.505-in. diam tensile specimens were used. A recording extensometer was used in almost all cases, and the yield point reported is 0.2 pct offset.

The analysis of all the heats reported here were in the range given in table I.

The range shown in table I may be considered rather wide. However, the greater part of the tests were close to the middle of the range.

The average physical properties of ductile cast iron in the as cast condition are given in table II. It will be noted that there is a consistent lowering of these properties as the section size increases. The ductility, as indicated by the elongation, is not entered in the table, because it was

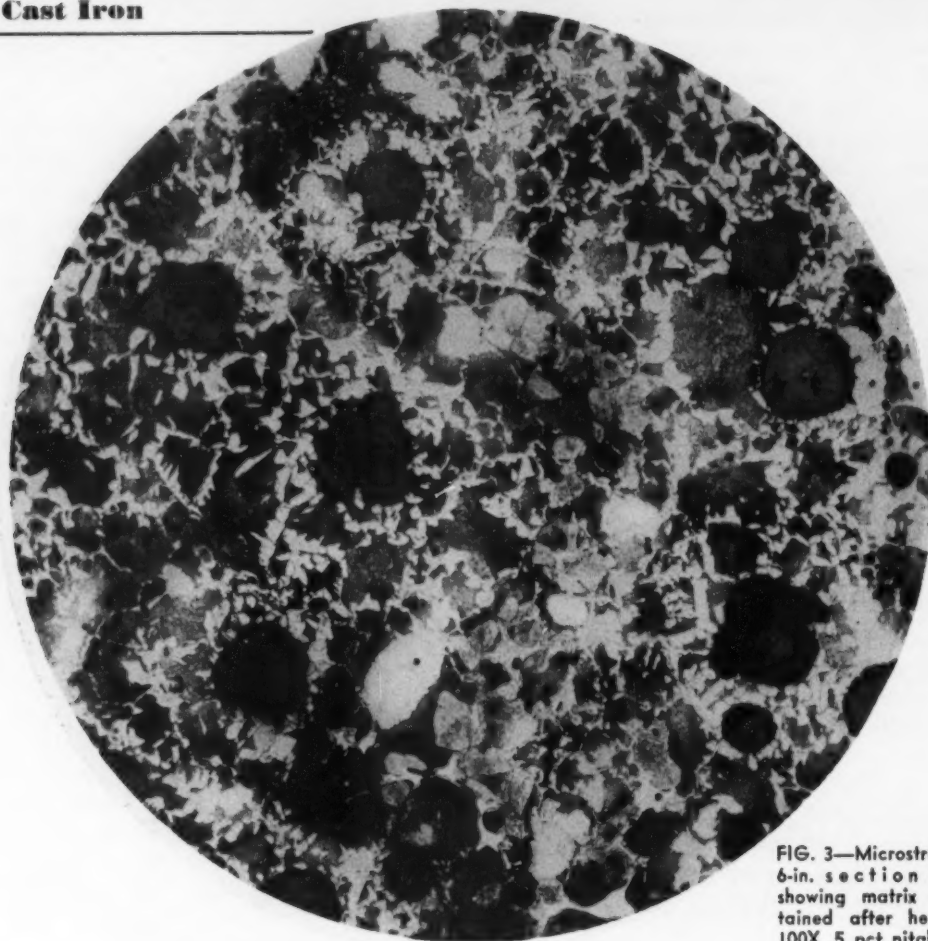


FIG. 3—Microstructure from a 6-in. section of keel block showing matrix structure obtained after heat treatment. 100X, 5 pct nital etch.

very low, in most cases not measurable. The widest variation in tensile strength was in the 1-in. keel blocks. Here the variation was between 72,000 and 99,300 psi.

This wide variation was attributed to the tendency of this section to produce a certain amount of free cementite, which is reflected in the hardness. The variation in the other sections could be considered normal, being less than 5000 psi.

The effect of heat treatment, is shown in table III. The variation of the various heats, as far as tensile strength and yield point were concerned, was not over 5000 psi. The variation in elongation was in general not over 5 pct; in hardness it was about 40 points — from 160 to 200 Bhn.

It will be noted that when properly heat treated the influence of section size on the tensile strength is small. The authors conclude that a tensile strength of around 70,000 psi, and a yield point of around 55,000 psi, using the metal and analysis listed in table I, can be expected.

It will be noted that elongation in the heat treated material is good for sections below 3 in. but drops considerably for heavier sections. However, if a traverse is taken across the heavier sections, as shown in table IV, it will be noted that the outside has a comparable ductility to the thinner sections, but drops off quite rapidly

toward the center. This is not an uncommon phenomenon, as it occurs in gray iron, cast steel, and forged steel.

In order to obtain maximum ductility in ductile cast iron it is necessary that the matrix structure be ferrite (really silicon-ferrite). It has been reported that this can be accomplished in the as cast condition. However, in most of the cases cited the iron has been cast into relatively thin sections such as a 1-in. keel block. In the range of analysis reported here, the as-cast matrix has been mostly pearlitic, as shown in fig. 2, thus heat-treatment has been necessary to break down this matrix.

The normal heat-treatment recommended is to heat into the austenitic zone to break down any cementite present, then cool to below the A_{r1} and hold for a short time, cool in air. The regular heat-treatment adopted for the tests was: 1700°F, hold 5 hr, cool in furnace to or air cool to 1250°-1260°F, hold for various lengths of time until the microstructure shows a complete breakdown of the matrix. The length of time varied considerably from heat to heat. Some heats required 20 hr at the lower temperature and others required only 5 hr. As section size increased, it became more difficult to break down the matrix.

One heat which appeared to be completely normal as far as analysis was concerned, with the exception of the phosphorus, was particularly

TABLE I

Analysis of Ductile Iron Heats

TC.....	3.25 - 3.53 pct
Si.....	2.04 - 2.33 ¹ pct
Mn.....	0.42 - 0.80 pct
P.....	0.06 - 0.13 ² pct
S.....	below 0.01 pct
Ni.....	1.58 - 1.95 pct
Mg.....	0.070 - .105 ³ pct

¹ One heat had 1.90 Si. ² One heat at 0.23 P. ³ One heat had 0.034 Mg.

TABLE II

Tensile Properties of Ductile Cast Iron in As Cast State

Section Size, inch	Tensile Strength, psi	Yield Point, psi	Hardness, Bhn
1	88,100	81,300	294
2	87,900	74,500	272
3	76,100	65,700	255
4.5	67,300	59,100	267
6.0	65,500	57,500	265

Note: The elongation obtained was between 0 and 1 pct for all sections.

TABLE III

Average Tensile Properties vs. Section Size of Ductile Cast Iron Samples in Heat Treated* Condition

Section Size, Inches	T.S., psi	Yield Strength, psi	Elong., pct	Hardness, Bhn
1	71,300	55,300	14.7	169
2	72,800	57,000	14.6	178
3	71,700	56,000	11.0	172
4.5	69,000	55,900	5.5	173
6	67,100	56,700	4.1	172

* Heat treatment consisted of 1700° F, hold at least 5 hr, then cool to 1250° to 1260° F, holding time being varied to give highest ductility.

TABLE IV

Variation of Tensile Properties Across the Section of Heat Treated Samples (Average of a Number of Tests)

Location Of Test	T.S., psi	Yield Strength, psi	Elong., pct	Hardness, Bhn
4.5 in. Section				
Outside.....	72,800	55,700	10.7	167
Midway.....	72,600	57,900	6.7	183
Center.....	73,300	57,300	6.3	180
6 in Section				
Outside.....	73,200	58,500	11.4	168
Midway.....	70,500	60,500	7.5	171
Center.....	68,100	58,500	5.5	171

TABLE V

Physical Properties of a Heat of Ductile Iron (Heat Treated)

Section, inches	TS, psi	Yield Point, psi	Elong., pct	Hardness, Bhn
1	76,500	59,000	11.0	192
2	73,200	57,700	10.0	192
3	76,250	67,000	5.5	192
4.5	85,500	57,200	3.5	207
6	81,900	59,700	1.0	187

TABLE VI

Impact Strength
(Modified Izod Test 0.798 In. Bar-120 Ft-Lb.)

Normal gray iron with 30,000 psi tensile strength.....	10-14
Highly alloyed gray iron with 60,000 psi tensile strength...	20-30
Ductile cast iron in the as cast condition.....	50-90
Ductile cast iron heat treated for maximum ductility.....	120 plus ¹

¹ This type of material stops the tup and will not break when hit repeatedly.

difficult to heat treat. The analysis of the metal was: TC 3.25, Si 2.03, Mn 0.60, P 0.23, S 0.008, Ni 1.78, Mg 0.104.

This heat developed the properties shown in table V, after the following heat treatment: 1700°F—5 hr, furnace cool to 1250°F, hold 12 hr, cool in air, reheat to 1275°, hold 15 hr.

It can be seen that there is little or no ductility in the 6-in. section. The microstructure of this section is shown in fig. 3. A number of different heat-treatments were tried with no success. The matrix structure would not completely break down to ferrite. The authors have no proven explanation of this condition up to the present time. We do not believe that the high phosphorus content is the sole contributing agent to the trouble. This case is reported here to show that the heat treatment of ductile cast iron can be quite difficult. This, fortunately, is not true in most cases.

Impact Strength of Ductile Iron

It has been pointed out that ductile cast iron has excellent impact resistance. There are so many ways of testing impact strength that it is impossible to compare the results of the various reports. The impact test adopted by Cooper-Bessemer is the 0.798-in. diam Izod test which is used quite extensively in England.

Some of the heats showed very low impact in the as-cast condition on tests made from the 1-in. keel block. This was explained quite readily by the fact that there was a considerable amount of free cementite present. On the average, however, the impact strength in the as-cast condition was much higher than that experienced for a Class 30 or Class 40 gray iron. It was also quite a little higher than a Class 60 acicular iron.

In the heat-treated condition, the impact strength of the material was frequently so high that it would stop the tup of the impact machine for a number of blows.

Table VI gives the range of impact resistance of various grades of cast iron. No average figure would be of value because of the idiosyncrasies of the impact test. It was observed, however, that to obtain high impact value, a minimum elongation of 5 pct is required.

The authors will conclude this article next week with a presentation of the first published data on notch endurance limits of ductile iron, and will describe a series of endurance tests, involving both static and dynamic forces, of full size castings.—Ed.



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Continuous Casting at Bristol Brass

SUMMARY: Details of the operation of the Rossi continuous casting machine installed at Bristol Brass Corp. are given herein, together with a discussion of advantages resulting from the installation of this unit and the mechanizing of material handling operations in the raw material and casting departments. Examples are cited of the greater uniformity of analysis of continuously cast stock.

ANY firm engaged in manufacturing is constantly faced with the problem of making a better product without increasing cost, or reducing costs without lowering the quality of its goods. The Bristol Brass Corp., of Bristol, Conn., confronted with the necessity of rehabilitating its raw material and casting departments, sought to accomplish both betterment of its product and the lowering of costs.

Following considerable study it was decided to purchase a Rossi continuous casting machine. The use of this machine fitted in well with a revised layout which simplified the flow of metal through the departments and which utilized conveyers to transport loads from one location to another on more or less a straight line basis. It was also believed that the quality of castings produced on the Rossi unit would be superior to those made in the other methods considered.

The Rossi machine at the Bristol Brass plant (see figs. 1 and 2) is the latest installation of this type of unit in the brass industry. Although the rearrangement of the department has not been completed, the machine has been in operation on billets and there is every indication that its performance will come up to or exceed expectations. Because of the fact that several heats from individual melting furnaces are at all times in the holding unit feeding the machine, it was logical to expect that the castings would be more uniform in the amounts of the various elements going to make up the alloy than would be the case when castings were poured from each melting furnace singly.

Analysis of coupons taken at 3500 lb intervals from the machine bears this out. Determinations made on 25 samples of a Cu-Zn-Pb alloy showed the extreme variation in copper content of 61.27 pct min to 62.03 pct max, and

in the lead content of 2.94 pct min to 3.15 pct max. Analysis on 25 individual and consecutive heats from the electric furnaces on the same alloy showed a range on copper of 60.03 pct min to 63.4 pct max, and on lead 2.55 pct min to 3.52 pct max.

Even more important in the manufacture of wrought brass mill products is the production of castings having a high degree of internal soundness and cleanliness. The Rossi continuous casting process employs the principle of under-pouring in which the metal is tapped from the bottom of a molten bath and introduced below the surface of the molten metal in the mold by means of a tubular duct (see fig. 2).

Since in this method of transfer the stream of metal is at no time in contact with the air or surrounding gases and enters the mold with little or no turbulence, the possibility of oxidation during pouring and the entrapment of gas particles by injection is eliminated. A slight amount of oxidation occurs on the surface of the liquid metal in the mold as it is impractical to attempt to maintain a completely nonoxidizing, or reducing atmosphere in the mold cavity.

This surface, however, is visible and accessible to the operator at all times and frequent removal of the oxide skin by skimming minimizes the possibility of introducing oxide inclusions during solidification. The virtual elimination of the principal casting faults, such as oxide inclusions and gas cavities, inherent in

castings produced by conventional methods should result in the production of finished products practically free of spills, blisters, and laminations.

From the standpoint of economy of operation, the Rossi machine recommends itself in a number of ways. There is an immediate and substantial increase in the output per hour on the Ajax melting furnaces. In this method the molten metal is dumped into a ladle and transferred to the machine, the pouring time being a matter of only a minute or two.

Conventional casting in iron or water-cooled copper molds requires the use of runner-boxes or strainers from which the metal is admitted to the mold through properly sized and spaced holes in the bottom of the strainer. The time involved for this pouring and subsequent shrinking of the casting is a substantial part of the furnace cycle amounting in some cases to more than 20 pct. Castings so poured have at the top a collar or a gate which contains small particles of slag, etc., which must be removed either by sawing or shearing. As these gates are eliminated in the continuous casting machine, there is a saving in the electrical energy required of about $4\frac{1}{2}$ pct of the gross tonnage cast, together with the labor engaged in sawing or shearing operations.

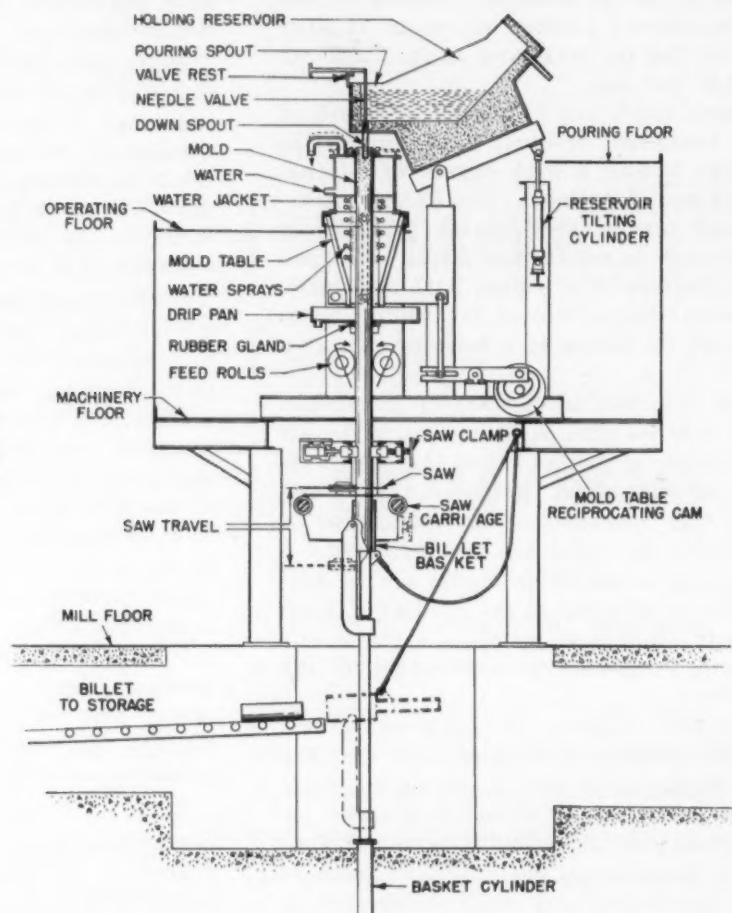
There is an additional saving in electrical energy due to the fact that the metal can be poured at somewhat lower temperature than is normally the case in conventional casting.



FIG. 1—General view of the continuous casting machine, with the molten metal reservoir at the top level. The sawn-to-length billet is moved to storage via an underground conveyor.

Continued

FIG. 2—Sketch of the Rossi machine at Bristol Brass. The machine can be fed through either of the two reservoir spouts located 180° apart.



Although no data are available at the moment, this lower pouring temperature will probably cut down the zinc loss by an appreciable amount. Where the machine eliminates the use of iron molds, as is the case in the Bristol operation, a substantial saving should be realized not only in mold cost but also in the labor engaged in handling, changing, chipping and cleaning molds.

Over the years there has been a tremendous amount of experimental and development work on the Rossi machine with the result that the machine, as it is now constituted, is relatively simple in construction and operation. A flow diagram of the path which the metal follows will show the delivery of the molten metal from the Ajax melting furnaces to a reservoir at the machine, thence through a valve and a downspout into a water-cooled copper mold, shown in fig. 3, which has a reciprocating vertical movement.

After the metal solidifies during its progress through the mold, it emerges into a series of water sprays (see fig. 2) which serve to quicken the cooling of the solid casting. Immediately below the spraying area, the metal passes through a pair of driven rolls which not only control the rate of casting, but also acts as a support for the entire column of metal.

The casting is then sawed to the desired lengths, caught in a tilting basket, as illustrated in fig. 4, dumped onto a conveyer and delivered to stock piles.

The reservoir, or holding unit, which contains about 4000 lb of metal is circular in section with two pouring spouts 180° apart (see fig. 3). At the bottom of the spouts are needle valves seating on tubular downspouts by means of which the flow of metal is controlled. Only one of the spouts is in use at any one time. Should anything go wrong with either the downspout or the valve the spare unit is immediately available by simply returning the holding unit to the horizontal position, rotating it 180°, and elevating to pouring position. In the meantime, the defective valve or downspout can be replaced.

The bottom of the holding unit is concave in shape and constructed so that when the unit is in a horizontal position, the metal can not escape. When elevated into pouring or casting position, the valve is submerged and is positioned over the center of the mold. The mold is a chromium plated copper tube of proper section and is contained in a cylindrical jacket through which cooling water flows continuously (see fig. 3). This whole unit rests on a frame known as the mold table.

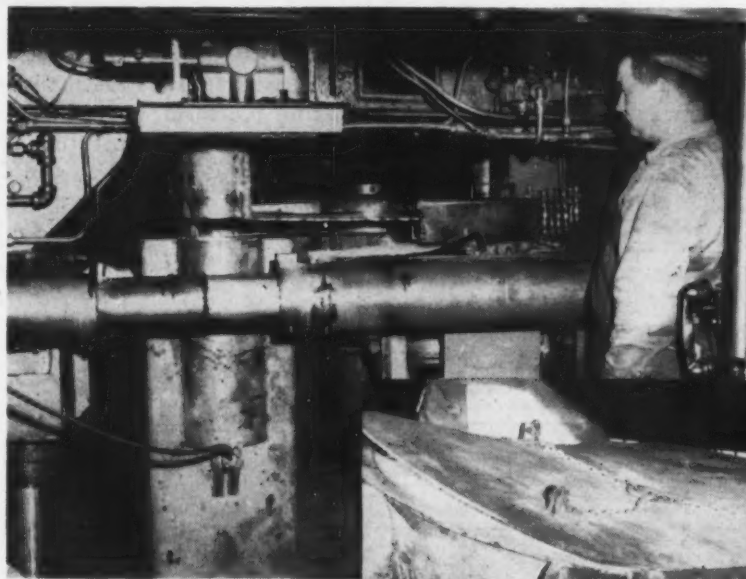
During operation this assembly has a reciprocating vertical motion, the downward speed of which is the same as that of the ingot being cast. The return to the top of the stroke is accomplished very quickly. This action permits casting against relatively still surface for 75 pct or more of the time. The metal is admitted to the mold through the downspout, the end of which is submerged below the surface of the molten metal at all times. Gas is burned across the top of the mold in order to keep oxidation at a minimum. An automatic system is also provided so that oil may be applied to the mold surface when necessary.

The speed with which the metal is cast is controlled by means of driving rolls located somewhat below the mold table. These rolls are activated by a variable speed drive which can be regulated by the operator at any time by means of a hand wheel on the operator's platform. The opening between the rolls can be readily changed to accommodate a range of sizes from 2-in. thick flat slabs to 10 in. diam billets. Sufficient pressure is kept on the metal between the rolls to support the entire column of metal which has been cast, and to drive the saw assembly downward during the cutting-off operation.

As the billet or slab descends, it passes

through the saw mechanism and into a basket which travels downward with the casting. When the basket reaches a predetermined point, which will give the required length, a limit switch is tripped. Grip jaws on the saw frame are then activated and the casting becomes the driving force for the entire saw mechanism. The saw, now descending at the same speed as the column of metal, travels horizontally and makes its cut (see fig. 4). The basket with the cut billet or slab continues its downward path until it is tilted over and spills the sawed casting onto a conveyer which delivers the metal to the storage area. The basket then returns to a vertical position and rises to its original station. In the meantime, the grip jaws have been released and the saw unit elevated, ready for another cut.

A crew of three men, consisting of a chief operator, assistant, and sawyer are used to man the machine. While the chief operator is the responsible head of the crew, in actual practice he and his assistant spell each other in their routine duties. One man stationed at the mold controls the speed of the casting through the manipulation of the hand wheel adjustment on the roll drive, regulates the flow of metal from the reservoir to the mold by means of the needle valve, and removes from the surface



LEFT

FIG. 4 — View from the floor level showing the saw carriage and the billet basket. The phone permits instant communication with the pouring level.



RIGHT

FIG. 3—View of the holding reservoir in pouring position. Also visible are the needle control valve, the downspout, the top of the mold and piping for the water jacket.

of the molten metal in the mold any oxides which may form. He also sees to it that the proper amount of oil is being delivered to prevent any sticking to the side of the mold.

The assistant operator receives the ladle of metal from the melting furnaces and operates the elevator for tipping the ladle. It is his responsibility to check on the water sprays occasionally. The sawyer operates the saw, takes coupons for inspection and analysis at regular intervals, and reports by telephone to the operator on any of a number of details such as the condition of the billet surface, whether the column of metal is straight, etc.

It is seldom possible to rearrange existing equipment or make extensive installations of new equipment within the confines of an old building and come up with an ideal layout. However, very decided improvements can be made and substantial savings realized in many instances with comparatively small capital expenditures when facilities are relocated to permit straight line production. The raw material and casting departments at Bristol presented such an opportunity.

The old layout was the result of a number of changes and additions over a great many years. When the building containing Bays A, B and C was erected during the First World War, the eastern half of Bays B and C was used as the casting area. In those days the metal was melted in and poured from crucibles. Heat was supplied by burning hard coal in a series of pits which went to make up a set of hand

fires. Bristol Brass engineers were among the first in the country to recognize the possibility of using electrical energy for melting purposes. Bristol was among the first to use electric melting furnaces when they became practical, and these furnaces were placed in the eastern end of Bay B. As time went on and further expansion became necessary, Bay D was built and furnaces added at the western end as needed. The end result of these changes was considerable backtracking and long carries, to a considerable extent, by means of platform jitneys. Furthermore, the furnace locations complicated somewhat the proper supervision of the work.

The use of conveyers in the revised layout, shown in fig. 5, permits the transfer of metal from one location to another with a minimum of handling. Raw copper, zinc and lead will be transferred by means of a gravity conveyer, from railroad cars to the western end of Bay D from which it will be fed to the scales on another conveyer line. Scrap will be received and prepared for use in the western end of Bay A and stored in an area adjacent to the scrap scales. On the east and west conveyer an empty container, below floor level, will be loaded with the proper amount of scrap, elevated to floor level, and by gravity proceed to the copper and zinc scales where the required amounts of these elements will be added to complete a full furnace charge. The filled containers will be stored on the conveyer line.

As charges are needed at the furnaces, containers will be released and automatically elevated to the casting platform, hooked on to a monorail hoist, which can be controlled from each furnace station, and carried to the furnace. Empty containers will be returned to a second elevator which will take them to the

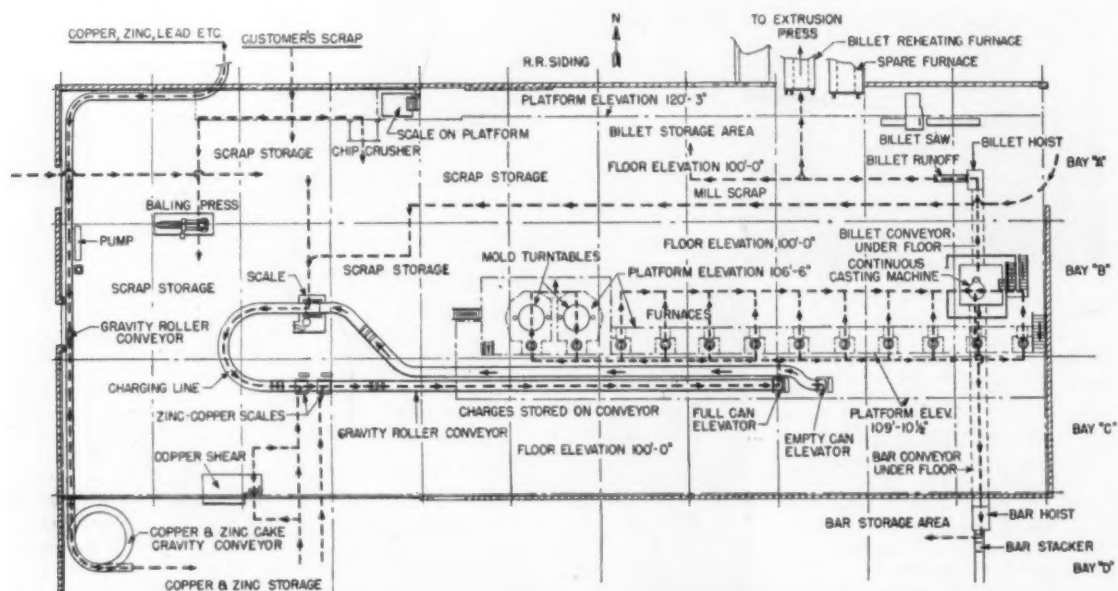


FIG. 5—Layout of the raw material and casting shops after alterations. This arrangement will minimize manual handling and permit more accurate control of makeup charges.

lower level and kick them on to the conveyer which will deliver them to the scrap scale.

When the metal has been melted it will be dumped into a ladle and transferred by crane to the casting machine. As the cast metal is sawed off the billets will proceed on conveyers under the floor to Bay A, elevated, and stored in back of the billet heating furnace. Slabs will be conveyed under the floor to Bay D, elevated, and stored ready for use.



Typical continuous cast billets at Bristol Brass cut to length for extrusion.

New Books

"Iron Blast-Furnace Slag: Production, Processing, Properties, and Uses," Bulletin 479, by G. W. Josephson, F. Sillers, Jr., and D. G. Runner, Bureau of Mines. History and development of the slag industry, as well as the production and processing of iron blast-furnace slag are described in detail in the bulletin, which also discusses the chemical and mineralogical composition of iron blast-furnace slag, its physical properties and specific uses. Appendices cover materials required for slag concrete, slag mortar, and asphalt concrete, and specifications and methods of testing slag. Superintendent of Documents, Government Printing Office, Washington 25. 75¢.

* * *

"ASME Mechanical Catalog and Directory." The 39th annual edition of the directory contains sections on catalogs, trade names, and ASME publications, in addition to the main listing of sources for equipment, machinery and supplies needed by the mechanical engineer. Descriptions of many items make this a handy catalog for industries to use in selecting equipment for manufacture and plant maintenance. Distributed to ASME members only, without charge. The American Society of Mechanical Engineers, 29 W. 39th St., New York 18.

* * *

"Industrial Hygiene and Toxicology," edited by Frank A. Patty, General Motors Dept. of Industrial Hygiene. Subject matter includes techniques for good industrial hygiene administration and analyses of various environmental factors involving industrial workers. Vol. 1 deals with a general survey of the field, and vol. 2 covers specific contaminants such as gases, dusts, vapors or fumes, solvents, X-rays, gamma rays, and radioactive materials. Other sections discuss abnormal temperature and humidities, plant lighting, noise intensity, skin inflammations, ventilation, and personal respiratory protection devices. Interscience Publishers, Inc., 215 Fourth Ave., New York. Vol. 1, \$10.00, 559 p. Vol. 2, \$15.00, 750 p.

"Best's Safety Directory." The 1950-1951 edition of the directory lists hundreds of specific safety devices, describes and illustrates them, gives their uses, and lists the manufacturers and local dealers. Also described are safety hazards and suggested remedies. Alfred M. Best Co., Inc., 75 Fulton St., New York 7. \$5.00 494 p.

* * *

"Engineering for Production," by Walter Ernst. A handbook containing essentials of engineering design data, with particular emphasis on engineering drawing. Useful information is presented on design of castings and forgings, metals and heat treatment, threaded connections and screw thread standards, piping, packing and gaskets, splines, gears, bearings, power transmissions, and lubricants. Research Press, Inc., 137 N. Perry St., Dayton 2. \$10.00.

* * *

"Metals Reference Book," by C. J. Smithells. Data are presented in the form of tables and diagrams with a minimum of descriptive matter to present a convenient summary relating to metallurgy and metal physics. A limited bibliography at the end of each section refers to the more important original sources of the material presented. Interscience Publishers, Inc., 215 Fourth Ave., New York 3. \$13.50. 735 p.

* * *

"1949 Wage Rate Report for the Gray Iron Castings Industry." Data compiled from 632 industry contributors have been developed into a comprehensive report of straight time hourly rates and incentive earnings prevailing in the industry during July 1949 for 51 foundry job classifications. Average rates for 58 local labor regions, as well as for the country at large are given. Also included are summaries on pension plans, life insurance for employees, profit-sharing plans, number of paid holidays, and union affiliation. Copies of the report are available for purchase by gray iron foundries. Gray Iron Founders' Society. 1010 Public Square Bldg., Cleveland. \$15.00. 120 p.

SOME NOTES ON THE ECONOMICS OF TONNAGE STEEL MELTING IN THE ELECTRIC FURNACE



By H. W. McQUAID

Consultant,
Cleveland

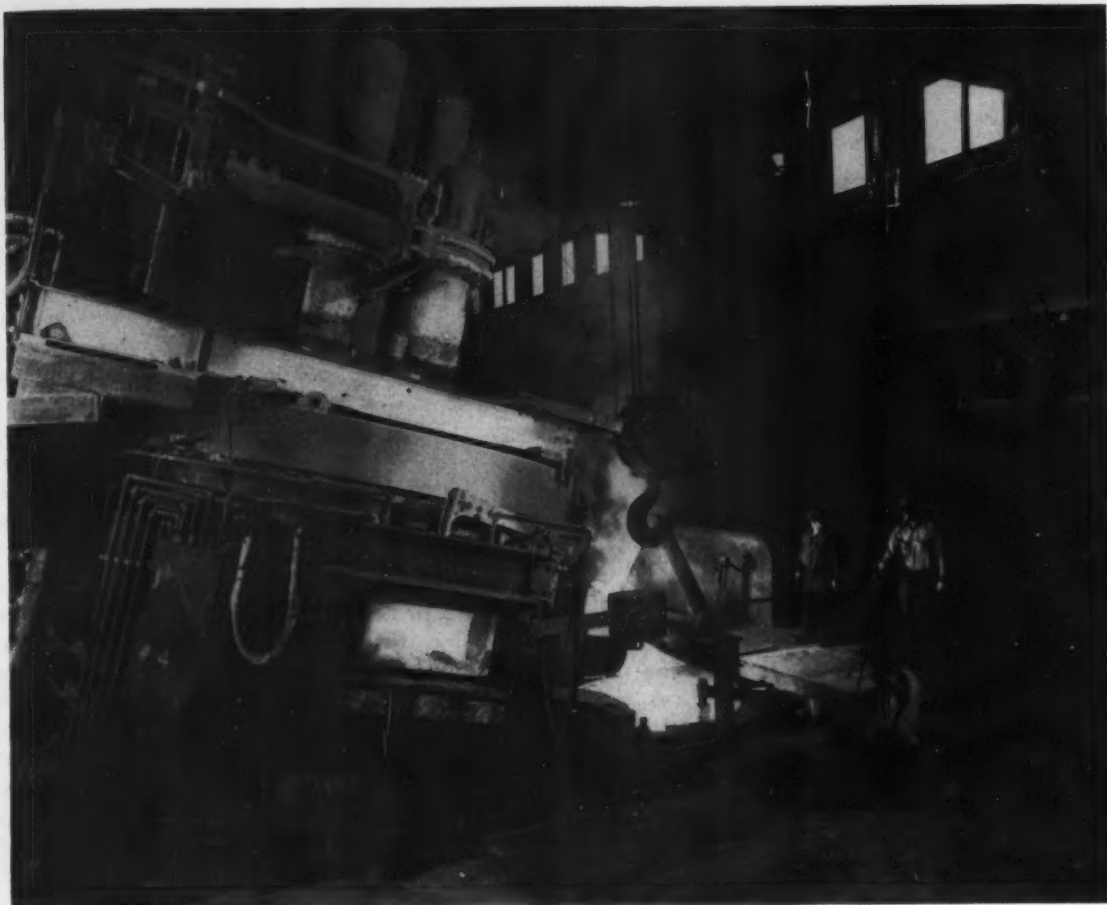
SUMMARY: Improvements in electric arc furnace design and operation, together with various adverse raw material market conditions affecting openhearth practice, make the electric furnace a strong competitor in the production of carbon and tonnage alloy grades of steel. Comparative cost data concerning these two methods and converter practice are presented, and factors influencing the economic conditions are discussed.

A GRADUAL increase, in recent years, in the use of electric furnaces for production of carbon steel,* has raised questions in the minds of steel plant management as to the economic feasibility of such practice. The thought naturally follows as to whether this practice consists of isolated, unrelated instances, employed in cases of emergency production requirements, or whether it represents a trend.

General reaction to the suggestion that carbon and tonnage alloy grades of steel be produced in the electric furnace is a vigorous denial that the electric furnace melting plant can even approximate openhearth or converter costs, under any conditions. The reason for this controversy

is that, in general, steel plant management is not aware of the transformation which has been made in electric furnace economics with the swing roof, high voltage and power and large volume furnaces. Also, a change in the relative economic position of electric furnace and openhearth methods of melting has occurred in the past 2 or 3 years, due primarily to the high cost of coal (coke) and fuel oil and the development of fast melting single slag electric furnace practice.

To examine the comparative cost of raw materials and operation of a large openhearth and a large modern electric furnace, one might compare the departmental costs of a 200-ton open-



Tapping an electric furnace heat at the crucible Steel Co., Sanderson-Halcomb Works.

hearth and a 50 to 70-ton electric furnace in the melting of semikilled or killed carbon or alloy steel. In the openhearth the raw materials are hot iron from the blast furnace, or cold pig, revert and purchased scrap, and additions for slag-making and finishing the heat to meet the customer's specifications.

Hot metal costs vary from blast furnace to blast furnace, depending on furnace design and operation, on limestone, ore and coke costs and on the amount of gas credit allowance. There

* E. S. Kopecki, "Melting Rimmed Steel in the Electric Arc Furnace," *THE IRON AGE*, Sept. 26, 1946, p. 62; see also D. I. Brown, "Electric Furnace Rimmed Steel," *THE IRON AGE*, Aug. 7, 1947, p. 67.

does not appear in the immediate future much chance of coal (coke) or ore becoming lower in price, so there would appear little probability of either hot metal or cold pig iron becoming cheaper. This has a most important effect on stabilizing the present high cost of openhearth operation.

Operating costs of a well located and well operated blast furnace in the larger sizes, with ore at \$8 per gross ton at the furnace, sinter at \$10 per gross ton and scrap varying greatly, depending on the location, are approximated in table I. The cost of hot metal, at \$26 per ton,

does not include any general sales or administrative charges or the cost of converting into cold pig. A study of blast furnace costs of several furnaces at different locations would reveal a wide range in the final figures depending primarily on coke rate and cost, furnace condition, location, etc.

To the blast furnace (and openhearth) operator it is evident that in the cost of hot metal (iron) direct labor is a minor factor, so the principal concern is with ore quality and coke rate. The cost of coal reflects directly the cost of coke as does also the ever increasing cost of transportation. Because of inability to control raw material costs and transportation the direct cost of hot metal (iron) will vary greatly and may reach as much as \$15 per ton more in a less efficient, poorly located furnace as compared with that of a more efficient, better located furnace.

It must be remembered in this discussion that the cold iron charge openhearth is in a more difficult position than the hot metal openhearth plant, because it must operate on pig iron purchased in the market and hence iron cost is increased by a considerable amount.

The fixed high cost of coal, labor and transportation will keep iron at a high level so that the operator of a cold melt openhearth furnace

Tonnage Steel Melting

Continued

will find charge costs will continue to be high. This is especially important in the case of the steel foundry with openhearth furnaces that must compete with modern electric furnaces.

The economy of the openhearth, with iron (hot or cold) as its principal charge material, is therefore very much concerned with anything which affects the cost of coal or ore, whereas the electric furnace economy is principally affected by the cost of scrap and power.

The converter operator, whose charge is almost entirely hot metal, is very much affected by its present high cost. There seems to be little that can be expected in the way of lower cost basic materials in the steel industry, especially as regards converter and openhearth products.

In some plants the high cost of converter grade iron has resulted in an economy where steel from the converter is actually higher in cost than the openhearth or electric furnace product of approximately the same analysis.

In the case of scrap, which comprises a very high percentage of the electric furnace charge and a very important percentage of the openhearth charge, one finds that the great decrease in demand earlier this year has resulted in one of the most precipitous drops in the history of scrap. Thus, at the present time, a condition prevails where iron for the converter and openhearth furnace is still at the price prevailing

when the demand was high, whereas the price of scrap, which is the principal raw material for the electric furnace, has been nearly cut in half. This would appear to be only a temporary condition with the price of scrap tending toward a higher level. At the present market price of scrap and pig iron there will be a natural tendency to increase the percentage of scrap in the openhearth charge and decrease correspondingly the percentage of iron.

In general, in the larger openhearth furnace operating on hot metal, the maximum operating economy (lowest cost above material) is obtained when the percentage of iron in the charge is close to 60 to 65 pct and the usual tonnage producer would like to operate at this iron level. But with the present scrap and iron costs the tendency would be to reduce the iron, even at some decrease in economy.

The increase in the price of coal would be reflected in power costs as well as in coke costs but not to the same degree. Power plants vary greatly in their economy of operation, with those of the most modern design coming close to offsetting, by improved efficiency, the increasing cost of coal. In times of less than peak demand the less efficient generating stations in a group are shut down whenever possible, so that it is actually possible that decreased demand, within limits, may improve the economy of power generation. The great increase in new plants of highest efficiency now underway will insure some protection in power costs as the new plants are put on the line and the older, less efficient plants



Pouring a carbon steel heat from a top-charged electric furnace. Photo courtesy Allegheny Ludlum Steel Corp., Pittsburgh.



Taking temperature readings on an electric furnace heat being made in a top-charged furnace. Photo courtesy Crucible Steel Co.

are shut down for standby use.

In the electric furnace, if it is of the most modern design, with swing roof, high shell height and high voltage and power input, it has been found that faster melting and lower costs can be obtained with the lower grades of scrap, and overall economy has been improved greatly above prewar operation. While modern electric furnaces of this type are few and usually handicapped by installation and practice restrictions, enough steel has been made under fairly good conditions to indicate the production economies possible.

Many electric furnaces considered modern because of recent (within the last 10 years) installation are obsolete because of absence of top charging, low furnace volume and low power input at low (relatively) voltage. A hard-driven, top-charged furnace of 60 tons capacity, with the electrical equipment designed for up to 400 v operation at 30,000 amp per phase, can melt high quality carbon (and single slag alloy) heats in an average time of 3 hr tap to tap.

This means a production of 20 tons per hr and requires a deeper shell than usual and a swing roof which will permit the charging of scrap in buckets holding 15 tons (of scrap). It also requires a mechanical trip on the buckets and an electrode clamp controlled from the floor.

Under conditions now (August 1949) existing, comparative openhearth and electric furnace cost figures given are averages for furnaces producing tonnage carbon steel and will naturally differ from other plants operating under better or worse conditions. They are only offered as an approximate indication of the relative position at this time of the three methods used in steel production.

The net material cost per net ton of carbon steel ingots might be approximately as given in table II. These costs vary from plant to plant, even within the same corporation, and are offered

as comparative figures. The important factors in the material cost are the percentage of iron in the mix and the cost of iron and scrap.

The price set on scrap as compared with that of either hot metal or pig iron is the most important factor in determining the economic position of the large arc furnace as compared with the openhearth. The electric furnace of the type under consideration would be charged with approximately 15 pct revert scrap from mill operations, 75 pct of No. 2 heavy melting scrap and 10 pct turnings or light scrap. This mixture would vary from melter to melter.

The total cost of the scrap mixture would depend on the arbitrary price set on revert scrap and the price of purchased scrap. With the present price being artificially set it is difficult to base costs as set up on present day scrap prices, but with coal, coke, labor and transportation costs being firmly controlled and apparently fixed at present levels or higher, it seems probable that while the cost of the mixture of scrap in the arc furnace as indicated may increase considerably above present levels, it should not exceed the cost of hot metal at the openhearth when final stability is attained.

The type of scrap best suited to the electric furnace will vary from furnace to furnace and is affected primarily by the method of charging and the voltage and power available. A top charging furnace, when properly worked out, with the largest practical mechanically tripped buckets and the deepest practical furnace shell can use to advantage the lighter grades of scrap and with the normal revert scrap can operate most economically on No. 2 bundles or heavy melt, properly combined with turnings. This is not suited to machine charged furnaces which must pay a premium for scrap, especially when operating on relatively low power and voltage. High voltage is necessary to overcome the high resistance of lighter and less densely packed

scrap. The turnings are an advantage, when properly placed, in protecting the furnace walls from the arc.

It is very much to the advantage of the furnace operation to have the volumetric capacity of the furnace as large as practical in relation to the volume of the scrap, which in turn is better if not too dense. The voltage controls the area affected by the arc and should, for best results with lighter grades of scrap and fastest melting, be 300 v or more. The amperage determines the time of melting a given charge and on a low reactance circuit with the power factor close to 80 pct, it is theoretically possible to melt a given charge of scrap in any selected time. This is the fundamental difference between the electric furnace and the openhearth.

In an openhearth, the tons per hour that can be melted depends primarily on charging time and furnace characteristics, but with a standard fuel burner there is a definite limit to the rate of melting the charge which represents the maximum for the given furnace and charge.

In the electric furnace some of the same type of practical restrictions exist, but theoretically it is possible to melt the usual types of steel scrap at almost any desired rate by using the proper combination of voltage and amperage. This means that it is theoretically (and practically) possible to melt a charge of 50 tons in 1 hr if enough voltage is provided to overcome the scrap resistance so that sufficient amperage can be forced through it, say 40,000 amp at 350 v. This would require a 24,000 kva transformer, such as is now being used by one carbon steel producer.

If, instead of 1 hr, an hour and a half or even 2 hr, were taken to melt the 50 tons, transformer size could be cut accordingly. If the transformer was limited to 20,000 kva at 400 v it would require, at 80 pct power factor and with full power, close to 1.25 hr to melt a 50-ton heat. This would, with a top charge furnace, modern handling and control equipment and a good tonnage incentive, make it possible to make 50-ton carbon steel heats on an average well below 3 hr, tap to tap. This would correspond to more than 16 tons per hr, which is better than most of the present day openhearth, but which is an everyday occurrence in a few electric furnace melt shops.

Because of the shorter heat time, handling of ladles, scrap buckets and other auxiliary equipment becomes a most important problem, especially where several furnaces are in the same line. The most satisfactory setup is with the charging in one bay of the shop and the tapping in another, especially if the charging floor level is elevated to eliminate the need for ladle pits. The tapping of two furnaces into a common pit

becomes a serious handicap where heats are under 3 hr from tap to tap.

Even with the power and equipment required to melt 50-ton heats of second grade scrap in an average time of less than 3 hr tap to tap, it is necessary, in order to meet such a production rate, that the tonnage incentive be sufficiently high to keep the production pressure close to a maximum at all times. The setting of the incentive base rate which will keep the melt shop pushing the furnaces to the very limit is probably the most important single step in getting production up and costs down in melting tonnage carbon steel.

Conversion Cost Variables

The comparative cost of converting charge material into carbon steel ingots will also vary from plant to plant and even from furnace to furnace in the same plant. It will be affected by quality of charge, melting equipment used and the ability and interest of the furnace crews. In table III are given some figures representing a possible practice in high powered top charge furnaces that would be considered good in most plants. With furnaces of poor design, poor operation and an undesirable economical background due to location, product, or higher costs, the ingot costs will be much higher; with well located furnaces of good design and operation and with other factors favorable the ingot costs will be lower than given.

There will be a natural reaction that these figures do not check with actual practice in most plants and this would naturally follow, since they are supposed to cover that mysterious quantity known as average values. In this case the average values are as of the present moment in the making of plain carbon semikilled steel ingots. To the electric furnace operator making the usual run of electric furnace product the figures given for his type of furnace will seem abnormally low. They do reflect a practice with which he is probably not very well acquainted. They are based entirely on experience with crews having sufficient incentive, operating high powered, high voltage furnaces where charging time is a matter of minutes and where the production problem is primarily one of high melting speed, high oxidation rate of carbon and good temperature control using a high lime, single slag practice.

In the author's opinion, the electric furnace cost of melting can, under the best conditions, be reduced appreciably from the figures given. This will be accomplished by electrode oxidation protection, by better power factor control, deeper furnaces, improved furnace design and refractories and higher production per operating hour.

The position of the converter is more dependent on the cost of coke, ore and transportation than the others and the electric furnace and openhearth are actually competitive with the converter. Whether this is a temporary condition is hard to say, but apparently the converter will

have some difficulty in maintaining its position unless a radical reduction is made in the cost of iron.

With the electric furnace of the type being discussed, the principal factors in operating costs are power, electrodes and labor, and these in turn are affected greatly by the practice used and production obtained. It is distinctly noticeable that the kilowatt hours per ton of ingots drops rapidly with the use of higher voltage, high power input and top charging. It is adversely affected by poor design of the current carrying elements in the arc furnace, by high reactance and undersized electrodes. Every effort possible is necessary to eliminate common steel from the magnetic field zones set up by the heavy alternating currents and this requires a most generous use of a highly austenitic type of stainless steel in support arms, masts and bracing. If this is done there will be an appreciable decrease in reactance losses; cables should be of the largest practical area and preferably of the air-cooled type. Electrodes should be as large as commercially available and not less than 20 in. in diameter.

If all this is done, it is possible with the high voltage, high powered furnace to produce openhearth grades of steel for less than 500 kw-hr per ton of ingots.

It is possible with large enough electrodes under the same conditions to drop the consumption of electrodes per ton of ingots to less than 10 lb. This is an important factor in arc furnaces operating costs and can still further be reduced, it is believed, by the development of electrode coatings that resist air oxidation, which probably accounts for 50 pct of the electrode weight loss.

Transportation Charges Important

Whether the high powered, well designed, modern, top charged arc furnace is more economical to install and operate than an openhearth furnace depends on the availability of scrap and power and the location in regard to markets. If power and scrap are both available, the top charged arc furnace provides in many places the most economical means of producing all types of ingots.

The increased transportation costs on finished (and semifinished) steel have restricted the economic shipping range to the point where much consideration must be given to local steel plants of most modern design but based on relatively low monthly tonnage. It is in such a situation that the fast melting top charged arc furnace is advantageous. It has a flexibility both in type of product and in operation that lends itself well to meet local demands. It costs less to install than an openhearth of equal capacity and is easier to operate at a top production rate. It is satisfactory whether used to produce billet type ingots for direct conversion into bars, rods or strip, or to produce full sized ingots for conversion in conventional mills.

In many such areas the freight on incoming finished steel approaches the cost of melting the charge in a modern, hard driven, top charge arc furnace.

In summarizing it can be said that the large modern top charge, high powered electric arc furnace when operated so as to obtain close to the maximum production of carbon steel, can produce from second grade cold scrap more tons of steel per month than an openhearth furnace operating on the conventional hot metal and good heavy melt scrap. Just how much more depends on the furnace design and layout, the power available and the incentive set up for the melt shop crews. Whether the steel so made costs more or less than in the openhearth depends on the relative cost of hot metal, scrap and fuel oil in the openhearth and the scrap, power and electrodes in the electric furnace.

Comparative Production Costs

Under present conditions it would seem that a satisfactory grade of scrap will be obtainable for less than hot metal at the blast furnace, so that if the difference between the openhearth charge and the electric furnace charge is close to \$3 per ton of ingots in favor of the electric, then the final product in the ingot from the electric furnace will cost no more than that of the openhearth or perhaps be slightly lower. The conversion loss in the openhearth is normally between 10 and 12 pct while that of the electric making carbon steel is between 7 and 9 pct. This, on a \$30 per ton charge would mean an advantage to the electric furnace (at 2 pct) of close to 60¢ per ton.

In addition to the economic advantage now enjoyed by the modern high powered electric furnace there are other important advantages. The electric unit is much more flexible in its operation and can reduce carbon at a higher rate than the openhearth because it can consistently operate at a higher temperature where the carbon reaction with iron oxide is faster. It can operate under slags with a much higher percentage of lime and iron oxide which makes possible lower sulfur and insures better surface in the rimmed and semikilled products.

It was well demonstrated by a few producers during the steel shortage years of 1947 and 1948 that it is possible to make a better quality of rimmed steel ingot in the electric furnace than in the openhearth. This is due principally to the ability to tap under slags having a very high iron oxide content as compared to the openhearth but is also due to better temperature control and a more active final boil.

Rimmed steel ingots under such practice combined with skilled deoxidation control on pouring showed an exceptionally deep and uniform rim with a solid skin deeper than is usual with openhearth practice. Careful control in pouring also made possible uniformly high yields. When

properly handled, the rimmed steel grades tapped under very high iron oxide slags were made into unusually good rimmed ingots in sizes down to 4x10x84 in., indicating strong possibilities in the production of satisfactory cast slabs."

Carbon steelmaking in the arc furnace is almost diametrically opposed in its approach to that of the conventional two slag alloy practice. High power is the important requirement and high pressure on every operation with this reduction is the main objective. Fast melting, adequate temperature and a good boil, with plenty of lime or stone added early in the charge are the basis on which quality is built.

By the earlier charging of a heavier lime addition, it is possible to finish with much lower average sulfur content in the ingots for flat rolled products with definitely improved surface. By deliberately increasing the iron oxide content in the tapping slag of semikilled low carbon steel to above 30 pct, it is possible to produce high sulfur and other grades with the very minimum of conditioning costs. This is difficult, if not impossible, to do in the openhearth and there is thus possible in the electric furnace a simple means for reducing to a very low figure the cost of obtaining good surface in semikilled grades. In fact there is here a new field of development possible in the production of a high grade carbon steel product from big end down molds with the highest yields of commercially sound product requiring little conditioning and satisfactory for almost any application of low carbon, medium manganese steel.

TABLE I

Approximate Operating Costs of a Well-Located and Well-Operated Blast Furnace

Raw material cost (per net ton of iron):	
Ore, including sinter, per ton of iron.....	\$12.00
Dust, scrap and scale.....	1.00
Coke at 1850 lb per ton of iron.....	10.50
Fluxes.....	1.00
	24.50
Scrap and Dust Credit.....	-0.50
Total.....	24.00
Labor and direct operating cost (per ton of iron):	
Direct labor.....	0.50
Repair and maintenance.....	0.50
Air (blowing).....	1.00
Other costs, transportation, etc.....	1.50
	3.50
Gas credit.....	-1.50
Total cost charge.....	2.00

TABLE II

Approximate Net Cost of Materials per Net Ton of Carbon Steel Ingots for the Openhearth, Converter and Electric Furnace Methods

	Open Hearth	Converter	Electric Furnace
Hot metal.....	\$18.00 (58%)	\$40.00	.....
Cast scrap.....	1.00	.....	.....
Steel Scrap.....	13.00	2.00	\$26.00
Ore.....	.50	.....	.30
Additions.....	1.00	2.00	2.50
Credit (scrap).....	-.50	-1.00	-1.70
Cost of net material per ton of ingot.....	\$31.00	\$43.00	\$27.10

TABLE III

Approximate Costs of Converting Charge Material into Carbon Steel Ingots in the Openhearth, Converter and Electric Furnace Methods

	Openhearth (175 ton)	Converter	Electric Furnace (50-70 ton)
Fuel or power (net).....	\$2.50	\$0.40	\$3.15
Operating labor and incentive.....	1.50	1.25	2.40
Repair and maintenance.....	0.60	0.85	0.50
Refractories.....	0.50	0.35	0.65
Electrodes and supplies.....	.....	.....	2.40
Other.....	3.90	1.15	4.00
Total.....	\$9.00	\$4.00	\$13.10
Considering the above as bare departmental costs and adding 15 pct for general expense:			
	Material Charge, \$	Conversion Cost (incl. 15%), \$	Total, \$
Openhearth.....	31.00	10.35	41.35
Converter.....	43.00	4.60	47.60
Electric Furnace.....	27.10	15.07	42.17

The electric furnace has an advantage over the openhearth in some shops in that it lends itself much better to the 40-hr week and can be tied in more closely to rolling mill operations. There are shops where the rolling mills operate only for 5 days per week, whereas the openhearth are kept going for 7 days because of the difficulties involved in the shutdown and the extra fuel and other expense involved. With such type of operation the electric furnace presents much less of a problem and can be shut down for 2 days or longer with little extra expense or difficulty on starting.

Thus it can be said in conclusion that the electric arc melting furnace has now reached the stage in its development where it warrants the closest study on the part of those responsible for the installation of melting furnaces for producing steel in large tonnages.

Solderability of Lead-Tin Alloy Plating

By LAWRENCE H. SEABRIGHT

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SUMMARY: Various finishes are considered for use as a preliminary coating in soldering of electrical equipment. An investigation conducted for the purpose of determining the feasibility of lead-tin alloy plating and compare its solderability with that of hot-dip solder coating and pure tin electroplating is described.

IN the electrical industry, it has been found that a preliminary coating greatly facilitates soldering. Such coatings as hot-dip solder, pure tin, cadmium or bright alloy plating generally require a flux containing chloride or acid for satisfactory performance. A noncorrosive flux, however, such as the resin solutions, is in most cases preferable for assembling electrical equipment.

Earlier experiments indicated that pure tin electroplating prior to soldering was not entirely suitable, since the tendency for surface oxidation a few weeks after plating made soldering extremely difficult. Samples of the same terminals, hot-dipped in solder, gave excellent results at first, but a percentage of them darkened in storage, which also resulted in soldering difficulties.

From past experience, it was apparent that the three finishes most likely to produce good results were hot-dip solder coating, pure tin electroplating, and lead-tin plating. Samples were

prepared using these finishes, and an investigation was made for the purpose of evaluating the relative solderability of each.

The hot dipping process consists of first dipping the parts in a water solution of zinc chloride, followed by warming in a gas flame and immersion in the molten solder bath. The excess solder is allowed to drain off, and the parts are quickly transferred to a centrifugal spinner, which removes the excess solder and allows the parts to quench in cold water.

The quenched parts have a bright surface free from oxidation. These are now withdrawn from the water quench and tumbled in sawdust for drying. Thickness of the hot dip coating usually varies from 0.0003 to 0.010 in., depending on the type of part treated. While in some cases this causes no difficulty, it seriously interferes where parts are used as inserts in plastic molding, or close assembly work.

Electroplating pure tin is accomplished in a solution containing 12 to 14 oz per gal of sodium

stannate and 3 to 4 oz per gal of sodium hydroxide. The solution is operated at 170°F and a current density of 25 to 40 amp per sq ft. A tin coating of 0.0003 to 0.0005 in. was used in the tests.

Since the principal drawback of hot solder dipping is irregularity in coating thickness, the possibility of electroplating the same solder alloy was considered.

The lead-tin alloy was plated from a solution containing lead fluoborate, tin fluoborate, free fluoboric acid, boric acid and glue as an addition agent. The solution is prepared from commercially available concentrates. Typical analyses of these concentrates are shown in table I.

Lead-tin alloy may be plated successfully by using either alloy anodes or dual anodes. Alloy anodes are composed of lead and tin, cast in predetermined ratios. Dual anodes refer to the use of separate anodes of pure tin and lead, each having its own source of current. For most general lead-tin alloy plating, the alloy anode method is preferred because of simpler operation.

For plating any ratio of lead-tin alloy up to 60 pct Sn there are two important variables: (1) The lead-tin ratio of the alloy anode, and (2) the lead-tin content of the bath.

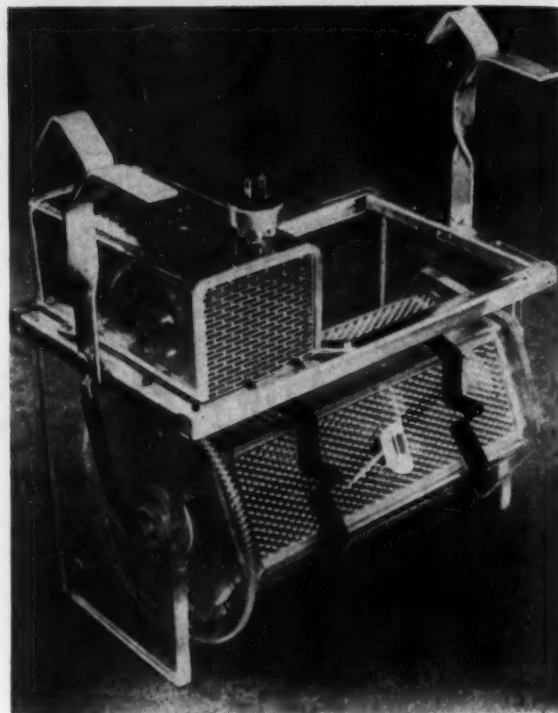
Table II shows the approximate composition of both the anode and bath recommended for various lead-tin deposits up to 60 pct Sn. The composition of the anode should be the same as that desired for the deposit. In case the resulting deposit does not have the desired composition, any necessary adjustments should be made on the bath composition.

Preparation of Solution

In the experimental program, a low melting point standard solder alloy was selected in order to expedite production and minimize overheating of the work. An alloy containing 60 pct Sn and 40 pct Pb therefore seemed the best choice. The range between the solidus and the liquidus points is referred to as the pasty range, where the solder is neither liquid nor solid. Work being soldered must not be moved in this range as joint failure would certainly occur, so a distinct advantage is obtained with a solder having a short pasty range.

Some solders with slightly higher tin content have even a shorter pasty range, but here another consideration enters in. The higher the tin content the greater will be the tendency for surface oxidation, especially after eutectic composition has been passed.

The conditions shown in table III have been found suitable for plating 60 pct Sn-40 pct Pb, and are representative of conditions required for a typical deposit. Based on the analysis of the



Plating barrel used for electroplating of lead-tin alloy.

lead and tin concentrates and suggested composition of the bath, the amounts of ingredients required to prepare a 100 gal bath for plating a 60 pct Sn-40 pct Pb deposit are given in table IV. The concentrates may be either weighed or measured, as is convenient.

The plating solution was prepared according to the following sequence of steps: (1) Add 50 pct of the required water to the tank; (2) add lead fluoborate concentrate; (3) add tin fluoborate concentrate; (4) dissolve boric acid in hot water; (5) add fluoboric acid; (6) dissolve the glue by allowing it to swell in a small quantity of cold water with stirring, and then raising the temperature to about 140°F until all the glue is dispersed; (7) add water to volume; and (8) operate the solution for a couple hours to remove impurities.

Boric acid is added to the solution to maintain stability. Approximately 3.4 oz per gal boric acid have been found suitable. Free fluoboric acid is maintained in the bath to provide the necessary acidity, to raise the conductivity of the solution, to give a fine grained deposit, and to prevent treeing. The recommended limits of fluoboric acid concentration are from 5.4 to 10.8 oz per gal. While this is not considered critical, the higher concentration further increases solution conductivity and throwing power, at the same time reducing anode sludge. These effects are especially desirable in the barrel plating of smaller parts.

Glue is added to the plating solution to promote formation of adherent, fine-grained deposits. A high quality bone glue is recommended for this purpose. In the operation of the solu-

tion, there is some breakdown and loss of glue. More glue should be added as evidence of duller deposits is noted. A glue concentration of 0.7 oz per gal is usually required for a solution deposition of 60 pct Sn-40 pct Pb.

TABLE I

Typical Analyses of Solutions for Lead-Tin Alloy Plating.

	Analysis		
	Pct	G per l	Oz per gal
Lead Fluoborate Concentrate ¹			
Lead Fluoborate.....	50.5	934	125.2
Lead.....	27.5	509	68.2
Free Fluoboric Acid.....	4.8	89	11.9
Free Boric Acid.....	5.0	93	12.5
Tin Fluoborate Concentrate ²			
Stannous Fluoborate.....	47.0	752.0	100.8
Tin.....	19.1	306.0	41.0
Free Fluoboric Acid.....	4.0	64.0	8.6
Free Boric Acid.....	3.0	48.0	6.4

¹ Solution weight is about 15.45 lb per gal, and sp. gr. 1.85.

² Solution weight is about 13.3 lb per gal, and sp. gr. 1.80.

TABLE II

Composition of Anode and Bath for Various Deposits

Deposit		Anode		Bath						
Tin, Pct	Lead, Pct	Tin, Pct	Lead, Pct	Total, Tin, G per l	Stannous Tin, G per l	Lead, G per l	Free HBF ₄ , G per l	Free H ₂ BO ₃ , G per l	Glue, G per l	
5	95	5	95	5	4	85	40	25	0.5	
7	93	7	93	7	6	88	40	25	0.5	
10	90	10	90	10	8.5	90	40	25	0.5	
15	85	15	85	15	13	80	40	25	1.0	
25	75	25	75	25	22	65	40	25	1.0	
40	60	40	60	40	35	44	40	25	3.0	
50	50	50	50	50	45	35	40	25	4.0	
60	40	60	40	60	55	25	40	25	5.0	

Stannous tin content is one of the important factors in successful operation of the lead-tin bath. If the "stannous" tin decreases, the percentage of tin in the deposit will fall; conversely, a high stannous tin content will result in a higher tin alloy. Mild agitation is important in lead-tin alloy plating, in order to insure uniform deposits. Agitation must not be too vigorous however, as it will cause an increase in the tin content of the deposit. Satisfactory agitation may be provided by barrel plating or cathode rod agitation. The operating efficiency of the process is about 100 pct for both anode and cathode.

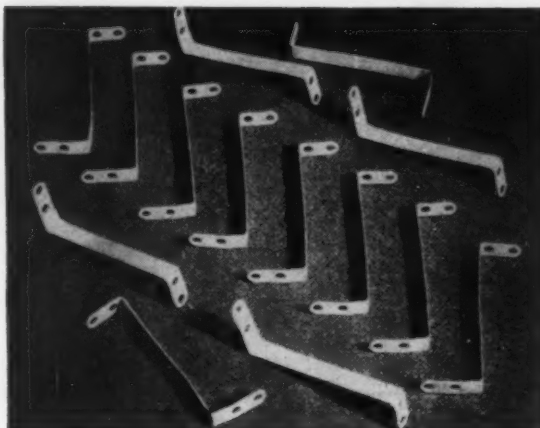
In an effort to determine the cause of surface oxidation on the coated terminals and to determine which coatings showed the least tendency to oxidize, the following coatings were applied on sample terminals for testing:

- (1) Pure tin as plated—0.0003 to 0.0005 in. thick
- (2) Lead-tin alloy as plated—0.0005 to 0.001 in. thick
- (3) Lead-tin alloy plated—0.0005 to 0.001 in.—and fused in molten palm oil
- (4) Hot solder dip coated.

Coatings such as copper, silver, bright alloy

and cadmium solder fairly well immediately after plating, but since past experience had shown how quickly these oxidize, they were not considered in this investigation.

One set of terminals finished with the above coatings was suspended over a rinse tank containing boiling water to determine resistance to moisture corrosion. Another set was placed in a wide mouth glass-stoppered bottle along with



Monel metal angular lugs plated with 0.0002 in. 60 pct Sn—40 pct Pb alloy.

TABLE III

Conditions Suitable for Plating 60 pct Sn—40 pct Pb Alloy.

Material	Composition	
	G per l	Oz per gal
Total Tin.....	60.0	8.1
Stannous Tin.....	55.0	7.4
Lead.....	25.0	3.35
Free Fluoboric Acid.....	80.00	10.8
Free Boric Acid.....	25.00	3.4
Glue.....	5.00	0.67

Operating Conditions:

Temperature—60 to 100° F.

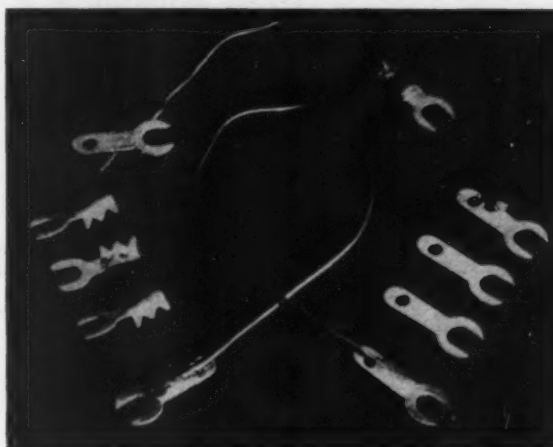
Current Density—30 to 50 amps per sq ft

Agitation—Mild (barrel plating or moving cathode rod)

Anodes:

Composition—60 pct Sn, 40 pct Pb.

Anode to cathode ratio, 2:1.



Copper lugs plated with 0.0002 in. 60 pct Sn—40 pct Pb alloy.

Solderability

Continued

some phenolic material, to test the action of phenolic vapors on the coatings. Another set of samples was placed on a stock room shelf where it was subject to the ordinary dusty and humid conditions of the shop.

TABLE IV

Ingredients Required for 100 Gal of Plating Bath.

Material	Amount	
	Lb	Gal
Tin Fluoborate Concentrate	260	19.6
Lead Fluoborate Concentrate	75.5	4.9
Water		65.5
Additions—		
Fluoboric Acid (42 pct)	121.0	10.0
Boric Acid	9.3	
Glue	4.2	

To check the solderability of the terminals after treatment, they were dipped in a resin flux and immersed for 2 sec in a molten solder pot. This test was used, since it was typical of the shop production soldering method. Coatings which were oxidized or corroded would not solder uniformly with this treatment.

Results of the samples exposed in phenolic vapors showed no change after 9 months, indicating that the phenolic vapors had no appreciable action on the coatings.

Evaluation of the solderability shown in table

TABLE V

Results of Terminals Exposed Over Hot Rinse Tank

Coating	Solderability		
	As Plated	2 Weeks After Plating	4 Weeks After Plating
Hot Dipped Solder	Excellent	Fair	Poor
Plated Lead-Tin Alloy	Excellent	Excellent	Excellent
Pure Tin Plating	Excellent	Fair	Poor

Results of Terminals Exposed in Stock Room

Coating	Solderability		
	As Plated	3 Months After Plating	9 Months After Plating
Hot Dipped Solder	Excellent	Excellent	Fair
Plated Lead-Tin Alloy	Excellent	Excellent	Excellent
Pure Tin Plating	Excellent	Fair	Poor

V is qualitative only. A report of fair indicates that a portion of the samples could be soldered satisfactorily while others could not be. A report of poor indicates that soldering either could not be performed or was extremely difficult.

From the results of the tests it is evident that the solderability of electrodeposited lead-tin alloy remains excellent for at least 9 months under normal operating conditions. In addition to improved solderability, the uniformity of deposit thickness has been substantially improved and the difficulty from assembling parts eliminated.

The author acknowledges his appreciation to W. A. McCracken, Kellogg Switchboard & Supply Co., for permission to publish this material.

Magnesium Alloys Studied

A COMPREHENSIVE survey of the mechanical properties of some 200 alloys in 40 magnesium alloy systems reveals that, of those systems studied, Mg-Zn-Ag-Mn-Ca is the most promising combination for further study and development, according to a report from the Office of Technical Service, U. S. Dept. of Commerce.

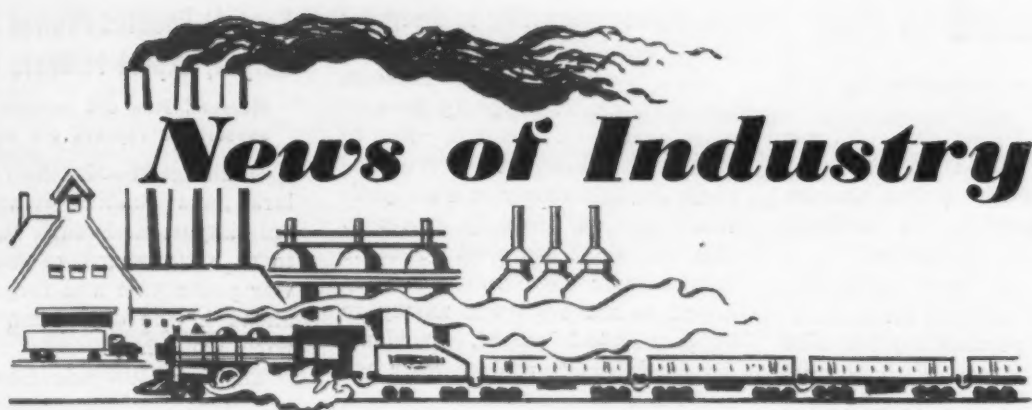
The study, undertaken by Rensselaer Polytechnic Institute for the Air Force, disproved certain favorable assumptions regarding the high mechanical strength and good workability of the German Giesche alloy. It also found that the addition of 5 pct each of the intermetallic compounds $Cd_{21}Ni_5$, Cd_3Cu , and Cd_3Sb_2 failed to improve the mechanical properties of Mg and Mg-Zn base compositions.

A preliminary investigation of warm rolling procedures for dilute Mg base alloys indicated

the possibility of increased ductility and toughness with moderate strength properties through these methods, although the data were too limited in scope to draw specific conclusions. Further study of the Mg-Zn-Al-Sn system agreed with earlier results indicating that Mg; Zn, 5 pct; Al, 3 pct; Sn, 3 pct was the best combination of this particular system.

The promising Mg; Zn, 5 pct; Ag, 1 pct; Mn, 1.5 pct; Ca, 0.3 pct alloy still has the drawbacks of hot shortness (tendency to break under stress when being handled under high temperature) and extreme sensitivity of its mechanical properties to small variations in composition and handling. Further investigations were recommended for overcoming these deficiencies.

The report, PB 97657, "New Magnesium Alloys," is available through the Library of Congress, Washington 25.



News of Industry

More Realistic Steel Prices Due in 1950

Some boosts may be in base prices, some in extras . . . Move will be designed to price items in line with actual production costs . . . Replacement need continues.—By TOM C. CAMPBELL

New York—Some steel firms are going to price their products more realistically in 1950. There will be price increases sometime within the next several months. Some may be a base price hike. Some or many will be on the basis of a revision in extra charges so that they reflect actual costs of processing.

There is a growing belief that steel products which do not pay their way should either not be

Adm. Ben Moreell, head of Jones & Laughlin Steel Corp., this week stated the case for higher prices. The first major steelmaker to touch the subject, his comments appear on p. 111.

made or that the price should be advanced. This is another way of saying that steelmakers are in business to make money. Some people are sure that the entire pricing system in steel is due for an overhauling.

Because of high costs encountered by steel mills in replacing equipment, many plants have not kept current on machinery. To do this they have to have the money to replace worn out or obsolete equipment. This does not mean indiscriminate junking of machin-

ery and plant just because it is old. It means elimination of machinery that is not paying its way and which is not standing up under current requirements.

Where will the money come from? Steel firms have wrestled with this for a long time. There are only two places where it can come from—earnings or depreciation. Depreciation alone is not enough.

For example, one firm must replace a boiler house. The present one cost about \$1 million. The new one will cost \$5 to \$6 million. This is replacement. It is not expansion. No one in his right mind would think of borrowing money for this rehabilitation. That would be only another way of borrowing money to pay dividends.

In this case, which is similar to many others, the boiler plant must be paid for from earnings.

Won't Change Depreciation

The government will not change the depreciation rules—at least not yet. The \$1 million will come from the depreciation account. The rest must come from earnings. The only way to get earn-

ings is to charge enough for steel products to make a profit that will pay the stockholders something and leave enough to keep plant in good shape.

In recent years an attempt has been made by one or two firms to charge steel price extras (charges made for specified chemical or physical characteristics) that are based on a new and different yardstick. On a strict cost basis these products should stand on their own, these people said. When an attempt was made to make these

Turn to Page 102

Hydropress Building Foil Mill for Italian Manufacturer

New York—Loewy Rolling Mill Div. of Hydropress, Inc., New York, has received an order for a complete high-speed rolling mill for aluminum foil from one of the leading manufacturers in Italy.

The installation consists of one 4-high breakdown mill and one 2-high finishing mill operating at 3000 fpm. It will have a production capacity of the thinnest aluminum foil of 400,000 lb per month.

A. O. Smith Income Gains

Milwaukee—A. O. Smith Corp. reported net profit for the 3 months ended Oct. 31 of \$1,916,376.00. These earnings compare with \$1,687,190.00 for the same period last year.

Steel Prices in 1950

Continued from Page 101

changes other steel firms did not follow. The firms which favor such changes are stymied because the buyer goes to the company with the lowest total price.

Increases in raw materials, freight rates and the latest staggering (and permanent) increase in labor costs mean higher steel prices. It looks as if semifinished steels will be upped either by extras or by base price increases. The same goes for structural shapes.

The technological changes in making flat-rolled steel items suggests that there may come a time when mill run hot-rolled sheet prices will come closer to those of cold-rolled sheets.

Most steel people point out that in the present economic pattern steel prices have been less sensitive to inflationary trends than most other products. They also argue that in the attempt to look at all angles and keep prices down the steel industry over the years has given up some of its profit by

inadequate marketing and pricing practices.

Steel is costing more to make in some forms. It is going to cost more next year. And it is going to cost more to keep steel mill equipment and machinery in a competitive condition. The only way to do this, say some top steel heads, is to run their company as if they hoped to make enough money to support good wages, pensions, dividends and to replace worn out and obsolete equipment.

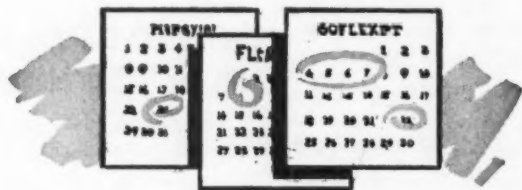
Resume Your Reading on Page 101

Nash Will Resume Operations

Detroit—Following a 23-day shutdown attributed to the coal and steel strikes, Nash's main automobile plants in Wisconsin will reopen Monday, Dec. 12.

Nash indicated that the production rate when operations are resumed will be about one-half the operating level prevailing before the strikes. The reduced schedule calls for the production of approximately 400 cars per day, according to Nash officials.

About 13,000 workers have been idled since Nov. 18 by the strikes, it was disclosed.



Dates to Remember

- | | |
|------------|--|
| Dec. 7-9 | National Assn. of Manufacturers, 54th Congress of American Industry, New York. |
| Dec. 8-9 | American Institute of Mining Engineers, annual conference, Pittsburgh. |
| Dec. 8-10 | American Institute of Mining & Metallurgical Engineers, Electric Furnace Steel Committee, annual conference, Pittsburgh. |
| 1950 | |
| Jan. 9-13 | Society of Automotive Engineers, annual meeting, Detroit. |
| Jan. 14 | American Electroplaters Society, annual meeting, Chicago. |
| Jan. 15-19 | Associated Equipment Distributors, annual meeting, Chicago. |
| Jan. 16-18 | Truck-Trailer Manufacturers Assn., annual convention, Edgewater Park, Miss. |
| Jan. 20 | Malleable Founders' Society, semiannual meeting, Cleveland. |
| Jan. 22-24 | Institute of Scrap Iron & Steel, Inc., annual convention, Washington. |
| Jan. 23-27 | American Society of Heating & Ventilating Engineers, annual meeting, Dallas. |
| Feb. 12-16 | American Institute of Mining & Metallurgical Engineers, annual meeting, New York. |

Renault Doubles Prewar Auto Output; Export Markets Opening

Marshall Plan aid enables French concern to replace old equipment.

Washington—Marshall Plan dollars have enabled Renault, the only important French auto works to be nationalized, to double prewar production and forge rapidly ahead in the export markets, reports here show.

The light, low-priced car is currently rolling from the assembly line at the rate of 330 a day. In addition, the plant is daily turning out 70 light commercial cars, 55 1-ton trucks, 20 2½-ton and four 7-ton vans, 40 tractors and one motor coach.

With an 18-hp motor and built to sell at the equivalent of \$900, it is a strong competitor on the continent for the Italian Fiat, which also has expanded production with ECA help. New export markets are opening up in the United States, Cuba, Panama, Spain and Australia.

Benefits from ECA Help

Last year, Renault produced a total of about 68,500 vehicles, twice the prewar rate. Of this quantity, more than 13,700 passenger cars and 4800 commercial vehicles were exported.

Like Fiat, Renault has benefited directly by ECA-financed equipment for restoring the factory, bombed out because it made tanks for the Axis. About 25 pct of the machinery was destroyed and had to be replaced; worn and obsolete types were replaced. This latter included 16 850 to 2200-ton body stamping presses.

Also, ECA aid was granted for development of French electric power and Marshall Plan funds supplied 44 pct of the petroleum products imported to drive French cars as well as 50 pct of the needed copper.

Renault facilities are well integrated, ECA data shows, the firm producing most of the materials needed, from cardboard to sheet steel. It has its foundries for turning out steel, cast iron, bronze,

aluminum and magnesium. Nearby are the parts fabricating plants while across the Seine River are tire plants.

Part of the recovery is due to introduction of American engineering skill. Assembly lines are patterned along the Detroit operations and other American techniques are taught and used.

C. J. Heale Dies Suddenly

New York—Charles J. Heale, 49, president, general manager and publisher of *Hardware Age*, died here suddenly on Dec. 1 following a cerebral hemorrhage. Mr. Heale, who was also a vice-president and a director of the Chilton Co., joined *Hardware Age* as an office boy in 1916. He advanced through that publication's advertising department to a position on its editorial staff. In 1919 he became associate editor and in 1923 became its Cleveland editor.

In 1932 Mr. Heale was appointed editor-in-chief and 2 years later a vice-president of *Hardware Age*. He had been its president and general manager since 1946. He is survived by his widow, Martha W. Heale, his parents, Charles and Eugenie Heale, and a brother, Kenneth A. Heale.

Aids Greek Automotive Program

Washington—Two American experts have been sent to Greece under the technical assistance program to help develop fuel development and automotive maintenance operations in that country.

Raymond G. Travis, Bureau of Mines engineer, will stay 6 months in Greece supervising diamond core drilling of lignite beds at Aliveri and other sites.

An automotive expert, Harry J. Doyle, will spend a year training Greek supervisors in automotive maintenance and modern shop operations. He will assist in setting up modern shop courses.

A third expert, Stephen G. Kershaw of Detroit, is already in Greece helping and advising in setting up plants for the manufacture of metal bus bodies.

Iron Age Readers Choosing Men of Industry

Men whose achievements have contributed most during past year to metalworking industry will be honored in Annual Issue Jan. 5, 1950.

New York—The practice of honoring outstanding achievement is a deeply rooted American custom. The traditions of the military arms are steeped with it in the form of citations. In sports the awards range all the way from the national marble championship to the all-American football team, where each man picks his own.

In industry there are a number of important awards, too. But most of them are for specific professions or special branches of industry. It is true that many industrial heroes remain unsung. Although it may also be true that achievement is its own reward, we think it is fair and proper to call attention to some of the success stories in our own broad field—the metalworking industry.

Wide Participation Invited

Who are the outstanding individuals in the metalworking industry? This is a question you can help answer. You can help answer it by voting on the accompanying ballot.

To focus attention on the contributions made by American industry to the nation's welfare, THE IRON AGE editors are conducting a poll of their readers to determine the outstanding MEN OF

INDUSTRY for 1949. The results of this poll will be published in THE IRON AGE Annual Issue Jan. 5, 1950.

Readers Will Choose Winners

Readers of THE IRON AGE, representing some 17,500 metalworking plants, are being asked to indicate the men they think have made especially significant contributions to the industry this year. Your participation is invited. Your choice isn't limited to classes of men. Your selections may be management, production, engineering or sales personnel. They may be selected from small plants or large plants.

But we do want to have your opinion so that credit can be given where credit is due. We're not opening a popularity contest. You should vote for the man who during 1949 has by his achievements contributed most, in your opinion, to the advancement of the metalworking industry.

Don't delay. Mark your ballot today. Just indicate the names of the two men you think have contributed the most to the metalworking industry during the past year. And mail it at once, won't you?

Men of Industry Poll
Iron Age
100 East 42nd Street
New York 17, N. Y.

*MY NOMINATIONS FOR IRON AGE'S OUTSTANDING MEN OF THE METAL INDUSTRY ARE:
(PLEASE PRINT)

Name	Name
Title	Title
Company	Company
City State	City State
*give full name and company affiliation	Signed Company

Urges Greater Productivity Through Modern Machine Tools

New York—The tardiness of American industry in replacing obsolete machine tools by new models of greater productivity is slowing down the normal advancement in the American standard of living, Tell Berna, General manager of the National Machine Tool Builders' Assn., told members of the American Society of Mechanical Engineers at their annual meeting here last week.

Productivity Benefits All

Never before in the history of our country, Mr. Berna said, has improvement in machine design been so rapid, and American business been so slow to take advantage of it.

He declared that when an advance in machine design makes possible increased productivity, benefits are realized by workers, stockholders and users of the end product only if and when the new machine is put to work in the shop. He pointed out that decisions to buy machines require a political climate suitable to (capital) risk or venture. "Needless to say that has not been the climate of recent years.

Asks Greater Productivity

"While tax policies have penalized investment in new capital equipment, social theorists have propounded the amazing theory that a higher standard of living comes from government rather than machine; seeking to do by

politics what can only be done by production."

He then called for a reversal of this trend. "Obsolete machines must be replaced; labor unions must learn that more jobs and better wages depend upon greater productivity; and the public must look to technological advances instead of to government for a more abundant way of life."

Engineering Jobs Expected To Increase 100,000 in Next Decade

New York—Engineers attending the 70th annual meeting of The American Society of Mechanical Engineers were told that jobs in engineering—the nation's third largest profession, and one of its fastest-growing occupations—may increase by as many as 100,000 in the next 10 or 12 years to a total of roughly 450,000.

Competition Will Be Keen

Engineering school enrollments are now so high, however, that many of the graduates of the next 4 years may be unable to find engineering jobs, although their training may help them get administrative, sales or other positions in industry.

For purposes of analyzing the long-run outlook for engineers, two assumptions were made: That high levels of general business activity will be maintained; and that the United States will not be engaged in a major war within the next decade.

The number of graduates is ap-

proaching unprecedented heights owing to the tremendous postwar expansion in engineering enrollments. In the academic year 1947-48, some 32,000 engineering students were graduated—an all-time peak. On the basis of enrollments in the fall term of 1948, it may be estimated that about 41,000 students will be graduated in 1949, more than 47,000 in 1950, about 36,000 in 1951, and nearly 29,000 in 1952.

Intensified competition for nearly all types of beginning engineering jobs will be experienced within the next few years. Students now in school would be well advised to get the best possible training. Minimum educational requirements are being raised gradually and the proportion of engineers with advanced degrees, though small, is increasing.

The type of work performed by an engineer has much to do with the amount of money which he is able to earn. Top salaries in all the major fields are earned by engineers in administration-management jobs.

New York Drops One Auto Tag

Albany—New Yorkers will use just one license plate per car next year. This year a small "49" tag was attached to the two 1948 plates on each vehicle, but many of these plates are too rusty and battered to be used again. Reason for the single plate in 1950: The state legislature decreed it because of a shortage of steel.

AMERICAN IRON AND STEEL INSTITUTE			Blast Furnace Capacity and Production—Net Tons						OCTOBER - 1949 Month			
	Number of companies	Annual blast furnace capacity	PRODUCTION									
			PIG IRON		FERRO MANGANESE AND SPIGEL		TOTAL					
			Current month	Year to date	Current Month	Year to date	Current month	Year to date	Percent of capacity			
				X		X		X	Current month	Year to date		
DISTRIBUTION BY DISTRICTS:												
Eastern	12	13,353,580	53,863	8,845,660	3,154	247,207	57,017	9,092,867	5.0	81.7		
Pittsburgh-Youngstown	17	26,625,920	200,988	17,040,724	-	178,003	200,988	17,218,727	8.9	77.6		
Cleveland-Detroit	6	6,984,600	63,528	4,619,320	-	-	63,528	4,619,320	10.7	79.4		
Chicago	7	15,655,390	135,492	9,845,089	-	25,475	135,492	9,870,564	10.2	75.7		
Southern	9	5,010,060	95,853	3,565,754	6,178	65,353	102,031	3,631,107	24.0	87.0		
Western	4	2,912,300	52,535	1,822,080	-	-	52,535	1,822,080	21.2	75.1		
TOTAL	37	70,541,850	602,259	45,738,627	9,332	516,038	611,591	46,254,665	10.2	78.7		

x Preliminary figures, subject to revision.



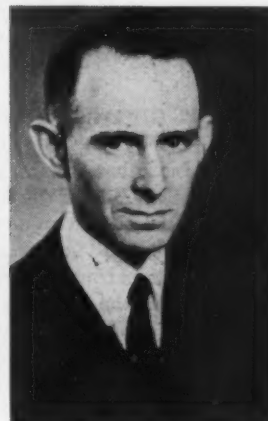
Fred L. Dornbrook



Fred B. Seely



Harold B. Maynard



Arthur M. Wahl

Outstanding Achievements Rewarded at Annual Meet of ASME

New York—Several outstanding members of the engineering profession gained recognition for their achievements at the 70th annual meeting of the American Society of Mechanical Engineers. The awards were presented at the "Honors Night" dinner, Thursday, Dec. 1.

The ASME Medal, highest honor of the society, conferred annually for distinguished service in engineering and science, was awarded to **Fred L. Dornbrook**. Mr. Dornbrook, who is general consultant, Power Plant Dept., Wisconsin Electric Power Co., Milwaukee, received the award for "outstanding engineering in the research, design and operation of pulverized fuel combustion equipment."

The Worcester Reed Warner Medal for "outstanding contributions to permanent engineering literature" was presented to **Fred B. Seely**, head of the Dept. of Theoretical and Applied Mechanics at the University of Illinois. The award cites Mr. Seely for "his astute and clear interpretation of engineering concepts in the field of theoretical and applied mechanics through inspired teaching, academic and professional leadership, and particularly through his outstanding permanent contributions to literature in the fields of me-

chanics and resistance of materials."

Harold B. Maynard, founder and president of the Methods Engineering Council, Pittsburgh, and a past-president of the Society for the Advancement of Management, received the Melville Prize Medal for "the best original paper or thesis on any mechanical engineering subject presented before ASME the previous year." Mr. Maynard was given the award for his paper, "The Role of Scientific Management in World Recovery."

Honorary memberships in the society were conferred on the following: **Oliver Vaughan Snell Bulleid**, consulting mechanical engineer, Coras Iompair Eireann, Inchicore Works, Dublin, Eire; **Roy Cummings Muir**, vice-president and general manager of the Apparatus Dept., General Electric Co., Schenectady, N. Y.; **Samuel William Dudley**, Dean Emeritus of the School of Engineering, Yale University; **Alex D. Bailey**, vice-president in charge of operating and engineering, Commonwealth Edison Co., Chicago, and past-president of ASME; and **D. Robert Yarnall**, co-founder and president of Yarnall-Waring Co., Philadelphia, and past-president of ASME.

The Richards Memorial Award for "outstanding achievement in

mechanical engineering within 20 to 25 years after graduation" was presented to **Arthur M. Wahl**, advisory engineer, Westinghouse Research Laboratories, East Pittsburgh, Pa.

Phillip S. Myers, assistant professor in mechanical engineering, University of Wisconsin, was presented with the Pe Tau Sigma Gold Medal for "outstanding achievement in mechanical engineering within 10 years after graduation."

The Alfred Noble Prize for a technical paper of exceptional merit to an author not over 30 years of age at the time the paper is presented went to **John C. Fisher**, research associate, General Electric Research Laboratory, Schenectady, N. Y., for his paper, "Anisotropic Plastic Flow."

May Reargue 29 FTC Cases

Washington—An opportunity to reargue a Federal Trade Commission complaint alleging conspiracy to fix identical delivered prices has been afforded the Chain Institute Inc., of Chicago.

FTC said the Chain Institute could reargue its case on Jan. 20. At the same time, the commission granted opportunities for reargument in 29 other pending cases.

INDUSTRIAL SHORTS

A GIFT—A \$20,000 grant from the Acid Open Hearth Assn., Inc., has been given to the UNIVERSITY OF PITTSBURGH to renew a research program in the metallurgical engineering department dealing with the refining problems in the acid openhearth method of handling liquid steel.

WINS AWARD—The Freedoms Foundation has awarded the WARNER & SWASEY CO., Cleveland, for their outstanding effort in fostering the American way of life by their advertising campaign.

IN BUSINESS—Announcement has been made of the formation of the LE JAX METAL PRODUCTS CORP. at 3-11 Lexington Ave., Brooklyn. Jack Bogatz will head the new corporation which will manufacture metal utilities.

NO. 14—The capital stock of Diamond Fire Brick Co., Canon City, Colo., producers of fire clay brick and silica brick, has been acquired by LACLEDE-CHRISTY CO., St. Louis. J. L. Cummings has been elected executive vice-president and D. M. Rice vice-president and general manager. This acquisition will give Laclede its fourteenth manufacturing unit.

NEW MARKET—Hose Accessories Co., Philadelphia, manufacturer of Le-Hi hose couplings, has appointed the EAST PACIFIC CO., Portland, Ore., as manufacturers' representative for the Pacific Northwest territory.

BUYS—All the patent, manufacturing and sales rights of the Barter-Ritco reversible grinder dog of the Rhode Island Tool Co., Providence, has been acquired by the READY TOOL CO., Bridgeport, Conn. Equipment for the manufacture of this grinder dog will be transferred to the Ready plant.

LARGER QUARTERS—It has been announced that FRIEDMAN BROS. STEEL CO. has moved to larger quarters at 2618 South Sacramento Ave., Chicago. They will have complete facilities for slitting and shearing as well as warehousing sheet, strip and plate.

HONORED — Paul R. Duffey, power engineer for the Youngstown Sheet & Tube Co., has been elected a "Fellow" of the AMERICAN SOCIETY OF MECHANICAL ENGINEERS. This honor is bestowed on an outstanding member who has qualified as a nominee and who has acknowledged engineering attainment.

INCREASING OUTPUT—The entire stock of the Flint Structural Steel Co., Flint, steel fabricators, has been purchased by the MISSISSIPPI VALLEY STRUCTURAL STEEL CO., Decatur, Ill. No changes in personnel are contemplated.

CHANGE OF ADDRESS—The offices of the ELECTRO CHEMICAL SUPPLY & ENGINEERING CO. have been moved from Paoli, Pa., to its new office and plant at 750 Broad St., Emmaus, Pa.

TAKES OVER—The activities of the Western Electric Hearing Aid Div. of Western Electric Co., Inc., has been taken over by the newly formed AUDIVOX, INC., New York. E. S. Gregg, vice-president of Westrex Corp., will be president of the new company which will be a subsidiary of Western Electric.

EASTERN OUTLET — Michigan Tool Co., Detroit, has appointed the F. H. HARRIS CO., Worcester, as its service and sales representatives on gear cutting and finishing machines, gear cutting tools and gear checking equipment.

Expand French Steel Works At Denain and Montataire

Washington — France has received about 80 pct of the \$29 million worth of American machinery and equipment needed for expansion of the steel industry in Denain and Montataire.

When work is completed some time in 1952, production of the Ursinor mills will have been raised to 1.3 million tons of ingots. Total cost of this project is estimated at \$58 million, of which the Export-Import Bank, Economic Cooperation Administration, and the International Bank will finance the half needed for equipment.

Included in the program is a hot strip mill at Denain and a cold rolling mill at Montataire. Most of the Denain production will be in the form of coils and thin and medium sheet.

Denain's current capacity is about 18,000 tons of sheet but will rise to more than 700,000 tons when the new strip mill goes into operation.

A new blast furnace will be added to Denain's facilities, doubling production to about 750,000 tons. Other expansion projects will increase openhearth capacity from 270,000 to 600,000 tons and Thomas steel ingots from 380,000 to 600,000 tons.

GM Wages Hold Steady; No Change Found in BLS Index

Detroit—Because of no change in the cost of living during the last 3 months, General Motors' hourly-rated and eligible salaried employees will continue to receive the same cost of living allowance during December, January and February that they received in September, October and November.

This allowance is 5¢ per hr for 290,000 hourly-rated employees. For about 65,000 salaried employees it will again amount to \$25 at the end of the quarter.

GM's wages and salaries are adjusted quarterly with the Bureau of Labor Statistics' Consumer

Price Index. After adjustment, the index for October was 169.3, unchanged from July when the cost of living allowance was last reviewed. The next review will be in March based on the BLS index for January.

ECA Allows Larger Profits For Increased European Output

Washington—If you can boost production in your European wide-gut factory by introduction of new techniques, the ECA will permit a larger conversion of profits into dollars.

In order to expand new industrial and commercial investments in Europe, ECA has previously guaranteed investors that receipts and dollars could be converted into dollars, up to 175 pct of the investments.

This has now been amended to provide that additional profits—derived from new processes and techniques, unique to the investor—may also be converted. The rate will be a maximum of one-fifth of such profits a year for a period of 5 years.

The concession was made to induce U. S. firms to make use overseas of secret processes and formulas which might speed production and recovery.

Car Sales May Set a Record

Detroit—New passenger car sales during October may have reached a new all-time high according to estimates recently prepared by R. L. Polk & Co., Detroit statisticians.

Estimates based on returns from 36 states for October indicate total new car registrations of 485,000 units for the month compared with the previous all-time high of 478,556 reported in August 1949. All makes of cars, except two, showed substantial gains, Polk said.

New truck registrations for October are expected to exceed 85,000 units which is slightly less than the September 1949 total of 89,253.

Fair Year Predicted for Gray Iron Founders

Ten million tons of business seen in '50 . . . One million less than '49 . . . Marginal firms are being weeded out . . . More business for stronger firms—By BILL LLOYD

Cleveland—Barring strikes in consuming industries, gray iron foundries will ship 10 million tons of gray iron castings in 1950, industry spokesmen predicted here this week.

This prediction anticipates a 1 million-ton drop from 1949 shipments which are expected to total about 11 million tons.

While some observers see 10 million tons as the minimum for the gray iron foundry industry next year, many major producers believe that automotive demand, major factor in the gray iron market this year, will taper off somewhat.

Certain conservative elements in the industry still see the 1950 tonnage as somewhat under 10 million tons.

Implement Demand Good

Farm implement demand looks good, and is expected to hold up with plenty of export business. It is expected to be at least as good as this year.

Machine tool demand has been

gaining momentum, and producers of heavy castings are expecting good business from this source.

In addition, household appliances, stoves, furnaces and seasonal factors in the foundry market, will consume their normal tonnage in castings.

In terms of tonnage shipped and distribution, 1950 is expected to be close to the normal pattern of demand for the gray iron foundry industry and a reliable criterion of what the industry will get in the years to come.

Marginal Producers Quit

The industry has lost most of its war babies, but spokesmen predicted that about 100 more would probably fold up their tents next year. Net result of this will be to leave the available business in the hands of stronger companies and make for greater price stability. Nor will the passing of a number of marginal producers tax remaining facilities of the industry, which operated at about 55 pct of capacity in September.

If the mortality rate seems high,

Turn to Page 108



"Hey fellah, gimme a 7/8 washer."

-ALL-

LeTourneau Shows a Profit

Peoria, Ill.—R. G. LeTourneau, Inc., has reported a net income of \$810,162 in the 8 months ending Oct. 31 this year. These earnings are equivalent to \$1.30 per share. LeTourneau, which has gone through a heavy reconstruction program on which they spent \$15 million, showed heavy losses in 1947 and 1948 but according to their president, R. G. LeTourneau, the program "is beginning to produce results." A revised statement for 1948 showed a loss of \$2,747,822.

Sales in the first 8 months of this year reached a total of \$13,754,903 which compared to a 1948 sales volume of \$19,014,591.

Gray Iron Founders

Continued from Page 107

spokesmen point out, the answer can be found in the level of operations for the industry during this year. In January, the gray iron foundry industry operated at 70.2 pct of capacity, high point for the year. For the next 6 months the drop was steady and the industry hit a low point of 39.8 pct in July, peak of the plant vacation period. The pickup has been gradual since July, reaching 55.2 pct in September latest available operating rate.

Prices Decreased 7.8 Pct

October and possibly November are expected to show some improvement.

Average operating rate for 1950 is expected to be about 50 pct or slightly higher. Capacity rate in the gray iron industry is figured on the average of the best 6 months since V-J Day.

Despite severe price testing, prompted in most cases by front office pressure, prices have held up remarkably well during 1949, according to industry spokesmen. Since Jan. 1, which was the end of the gravy-train period, the national average of gray iron castings prices is down 7.8 pct. It stands at 92.2 pct, based on Jan. 1 as 100.

The industry is also showing improvement in productivity. Present rate is 37.6 lb of gray iron castings per man-hr.

Raw Materials Plentiful

Other than the possibility of strikes in major consuming industries, chief problem of the gray iron foundries next year will be competition. Raw materials and manpower are plentiful. Coke is expected to be an adequate but fairly scarce commodity for the duration of the 3-day week in the coal mines. Otherwise, raw material problems are a thing of the past. Merchant iron demand is still in the doldrums and has not rebounded with other steel products.

Some observers see a broadening of the gray iron market in 1950 as a result of ductile iron. But this is not expected to hit its full stride until 1951.

Resume your Reading on Page 107

No Steel Loss Seen in 3-Day Coal Week

Steel companies will dig into reserve stocks to augment throttled mine output . . . They are set for at least 2 months . . . Other action to lift coal output likely before then.

Pittsburgh—With John L. Lewis's miners back on a 3-day week the steel industry generally will lose no production on account of coal. A few companies will be pinched but there is no chance that the captive coal mines will be forced to give in this year to maintain steel output as they were in 1947.

Opening of the soft coal pits on Dec. 5 on a 3-day week, will provide most steel companies with enough coal to maintain operations at current high levels for at least 2 months by drawing on reserve coal and coke supplies. By then it is likely that coal consumption of utilities and heating companies will have run so much higher than mine output augmented by their smaller reserves that Washington will have to act. That is, if the 2-day a week coal strike has not ended.

Down Again Up Again

The latest resumption of mining comes on the heels of the 10½-hr shutdown on Dec. 1, after expira-

tion of the 3-week truce declared by Lewis on Nov. 10. While no one knows the Lewis mind it is believed that he hopes to accomplish four things by the move: (1) Drive a wedge into the solid front of the operators; (2) cut coal stocks to improve his bargaining position; (3) reduce dissention among his miners; and (4) avoid Taft-Hartley action.

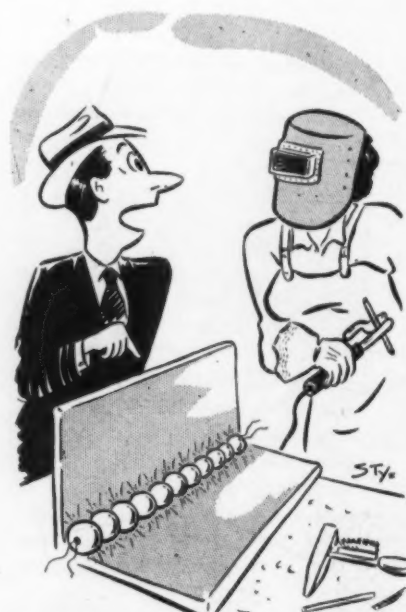
Lewis' Demands Secret

What Lewis wants is still a secret—if in fact he himself knows—but guesses set his goal at increases that would add 30¢ to 35¢ to each ton of coal mined. The operators want no increase and sound administration of the United Mine Workers benefit fund. They are now struggling for their lives against competing fuels. They say any increase would lose more business. The anthracite operators fear this too, but are worried about permanent loss of markets this winter if household users convert to oil in the East. So Lewis, figuring anthracite as the weakest point in the operator's line, is expected to try to crack hard coal men first.

Steel Companies Bought Coal

The reason most steel companies can thumb their noses at the UMW is that they bought a lot of commercial coal earlier this year. True, they paid high prices and are paying higher costs in their captive mines on the short week. But they have the coal and many have above-average coke piles too. With general demand intense they'll not be able to buy much more commercial coal this winter but they figure they can hang on longer than anyone else.

Back of the current coal mess, which has big operators almost fighting mad at Lewis's dictation, is a series of moves described as "inhuman and wrong" by George H. Love, president of Pittsburgh Con-



"Miss Doakes! Just what kind of a bead is this?"

olidation Coal Co., world's largest commercial operators, and spokesman for the Northern and Western operators.

A Heedle History

With coal stocks mounting, the miners were ordered out for 2 weeks on Mar. 11 of this year, ostensibly to protest against appointment of Dr. James Boyd as Federal Director of Mines. On June 13 a one-week strike began to "stabilize" supplies. The UMW contract ran out on July 1, and on July 5 Lewis ordered his soft coal miners to work only 3 days a week. On Sept. 19 a complete stoppage was called. The anthracite miners went back on Oct. 3, along with bituminous pits west of the Mississippi. On Nov. 10 the soft coal diggers were sent back to the pits for 3 weeks.

The fourth 1949 major coal strike began on Dec. 1 when the truce expired. It was halted the same day when Lewis told his men to return on Monday, Dec. 5 on a 3-day a week basis.

Join Warehouse Association

Cleveland—American Steel Warehouse Assn., Inc., has named 13 new members, 11 active and two associate, according to Walter S. Doxsey, president.

Active Members

Calvert Iron Works, Inc., Atlanta; Clingan & Fortier, Inc., San Francisco; Clingan & Fortier, Inc., Fresno, Calif.; DeVan-Johnson Co., Aurora, Ill.; Glendale Steel Corp., Glendale, N. Y.; Hays Supply Co., Memphis, Tenn.; Kritser Supply Co., Amarillo, Tex.; Missouri Valley Steel Co., Sioux City, Iowa; Neill La Vielle Supply Co., Louisville, Ky.; Horace T. Potts Co., Baltimore, Md.; Standard Tinsmith & Roofer Supply Corp., New York.

Associate Members

Kidd Drawn Steel Co., Aliquippa, Pa.; Pittsburgh Tool Steel Wire Co., Monaca, Pa.

Texas Co. Opens Eastern Oil Refinery

Modern plant marks movement of oil refinery industry to eastern seaboard . . . Waste recovery prevents air and stream pollution . . . Special steels used in construction.

Westville, N. J.—A new trend in the oil industry was marked last week—movement of new oil refining capacity into eastern seaboard areas in order to be in the best position to handle foreign crude oil. The first eastern refinery of the Texas Co. was opened here at Eagle Point on the Delaware River, near Camden, N. J.

Recovery Prevents Pollution

The modern refinery, which will process about 50,000 bbl of crude oil a day, has been set up to operate principally from Venezuelan and Arabian crudes. At present the United States is estimated to have about 30 pct of the world's crude oil reserves. But the consumption of this country requires about 65 to 70 pct of world crude production.

The new refinery is also noteworthy

as one of the few refineries that are equipped for complete recovery of sulfur from the gases evolved in processing. Freeport Sulphur Co. has erected on the site a plant which will process the lethal hydrogen sulphide driven out of the plant gases.

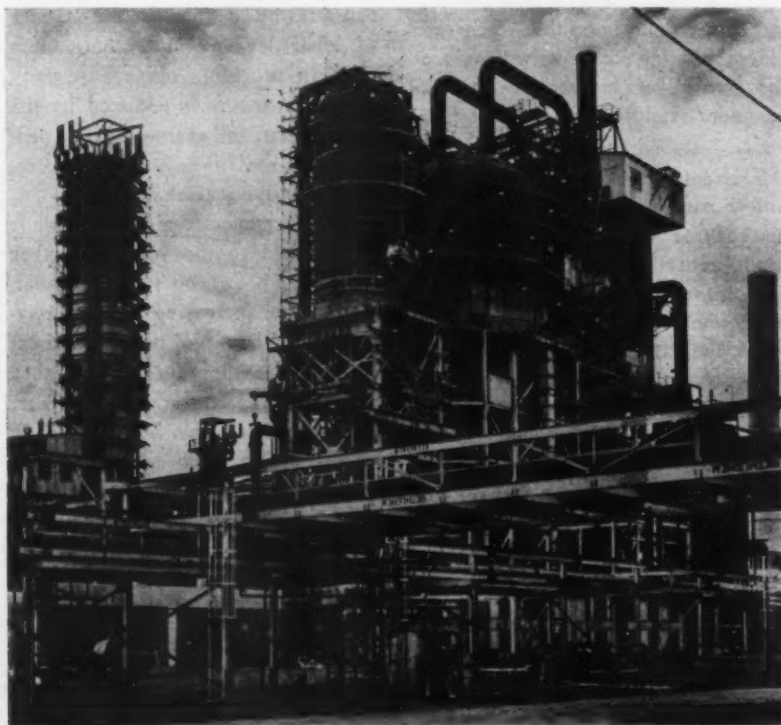
The recovery of sulfur, although not returning to the company much more than the cost of its recovery, prevents pollution of the air by plant operations. Plant wastes are treated in an oil separation plant to prevent pollution of the Delaware River.

Another important development is the first commercial refinery use of a furfural unit. In this unit, a solvent made from oat hulls is used to remove impurities from oils.

The new Eagle Point refinery is

Turn to Page 110

GIANT CAT: Growing demand for oil products along the East Coast has brought about a 25 pct increase in oil refining there. This unit at the Eagle Point Works of the Texas Co. is the newest in the area. It will produce a million gal per day.



Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Pension Postscript"

IT is now clear beyond any reasonable doubt that industry will have to bear the burden of employee pensions. The valiant rear guard action of the steel industry has failed to stem the tide of union power. Wherever an industry is organized under able union leadership, corporate earnings must bear the burden of human obsolescence in precisely the same fashion as they bear the cost of age and wear of plant and equipment. The analogy may be wholly false, but organized labor has made it stick—and is collecting.

This has resulted in some consolatory thinking, particularly in the financial district. The accumulating pension funds, it is hopefully argued, will prove a stimulant to business. Their growth has been estimated at 4 billion a year. Think of the boost that much money will give the economy! Furthermore, is it not likely that federal social security will be expanded in coverage and rate, thus reducing the burden of industry?

The reasoning that rising pension funds will stimulate business is off the beam. The hope that increased federal old age payments will reduce the burden of industry betrays a misunderstanding of trade union logic.

The corporate income that goes into a pension fund is income earmarked for a specific purpose. If sound actuarially, it will enable the corporation to meet definite future obligations to its employees as they cross the threshold of retirement. These charges to earnings serve the same purpose as payments into a sinking fund used for debt retirement. The future obligation to the employee has the same impact on the balance sheet as a funded debt.

It is difficult to discover in such a charge to earnings anything that can be regarded as a business stimulant. In fact, the contrary may be the case. The earnings set aside for future

pension payments would otherwise have been available for dividends to stockholders. Or as additions to liquid assets which would strengthen the company and enable it better to survive future strains. Or serve to underwrite new ventures which the company now finds it unwise to undertake.

It is doubtful if many companies will permit their pension funds to be invested in common stocks or serve as risk capital for new enterprise. Since pension obligations are dollar liabilities, these funds will probably be invested preponderantly in senior securities. They will constitute, unfortunately, another pocket in which government bonds may be parked. They will tend to make deficit financing easier and postpone the day when fiscal improvidence will exact its deserved retribution.

The notion that union leaders will stand by while the government *a la Tobin* relieves the companies of their pension burdens is not realistic. The unions have fought for pensions because their success is another measure of value to their members. How can dues be justified for the salaries of labor leaders when their functions in providing old age security for the members is assumed by the government, and everyone gets a pension—the scab no less than the faithful dues-paying worker?

At this moment General Electric is being cited to the National Labor Relations Board by irritated union leaders for increasing pension payments without channeling them through the apparatus of the labor organization. This is unfair to them, the labor bosses say, because GE, in effect, is telling the workers that they can get adequate pensions without the intervention of paid professionals. It is a subtle sabotage of the labor movement. Such thinking will hardly condone the transfer of the pension burden from corporate to governmental shoulders.

Opens Eastern Oil Refinery

Continued from Page 109

a fluid catalytic cracking unit of very modern design capable of producing high octane gasoline. Provision has been made for expanding its initial capacity to a maximum of about 200,000 bbl a day. But present market conditions may prevent expansion of capacity for some time.

The new plant is expected to place Texaco in a better position to handle its eastern market. The breakdown of production from imported crudes will be about 55 pct gasoline, 20 pct bunker fuel oil, 20 pct distillate, and the balance lost in gas.

The Texas Co. is about to open another new refinery at Tulsa, Okla. Recently the company has closed down three less economical refinery units at Dallas, San Antonio and Houston.

Refinery Industry Growing

The area from Jersey City to Wilmington is rapidly becoming the country's second largest oil refinery center. Nearly \$300 million is being spent by the industry on refineries in this area. When refinery building here and in the Southwest is completed, the industry will have a total capacity of nearly a million bbl a day, an increase of more than 25 pct over 1946 capacity. Practically all this refinery construction will exceed original cost estimates.

Special Steels Used

Highly alloyed steels are freely used in modern refinery construction to retard corrosion from the present high sulfur crude oil stock. In the catalytic cracking unit of the Eagle Point Works, built by M. W. Kellogg Co., New York, Lukens Steel Co.'s 11 to 13 pct chrome clad steel plate is used for the reactor vessel and fractionating tower.

Pipelines handling hot oil, gas-oil and slurry are made of 9 pct chrome steel.

In the crude oil unit, built by Foster-Wheeler Corp., New York, alloy protection for the upper sec-

tion of the atmospheric tower is obtained by the use of nickel clad steel. The lower section of the vacuum tower makes use of 11 to 13 pct chrome clad steel plates. In the lower temperature zones of the crude unit, and wherever corrosion is not a critical factor, 4 to 6 pct chrome steel is used.

Pipelines in certain locations where greater strengths are required are made from carbon molybdenum steels, containing $\frac{1}{2}$ and 1 pct Mo.

Follansbee's Toronto, O., Plant Is Offered for Sale

Pittsburgh — The Toronto, O., plant of Follansbee Steel Corp. is up for sale, according to Mark Follansbee, company president.

Efforts are now being made to dispose of the plant, which has an ingot capacity of 136,080 net tons and a finishing capacity of 124,800 net tons of forgings.

Plant equipment includes four basic openhearth furnaces, each rated at 55 tons; one 30-in. 2-high 1-stand reversing billet mill; 16 standard box annealing furnaces, five oil fired and 11 electrically-heated; two continuous annealing furnaces, one pickling machine and one 1000-ton forging press.

It was emphasized that the proposed sale will not affect the company's ability to serve its customers as it has in the past. All manufacturing operations will be concentrated at the company's main plant in Follansbee, W. Va.

GM Will Show New Models

Detroit—General Motors' 1950 model automobiles will be shown to the public at the Waldorf-Astoria in New York, Jan. 19 through 27.

GM plans to use more than 25,000 sq ft for the Show. In addition to elaborate model displays of the several GM lines, there will be extensive exhibits of engines and transmissions. The exhibit will emphasize the progress made in motor car design since the turn of the century.

Admiral Ben Moreell Sees Higher Steel Prices Coming

Pittsburgh—As far as Jones & Laughlin Steel Corp. is concerned, steel prices are going up, barring a sharp reversal of rising costs of production.

Admiral Ben Moreell, chairman of the board and president of J. & L., makes no bones about it in a statement taking cognizance of the fact that cost of raw materials, services and labor are rising, placing producers in a position where, as a matter of self-preservation, they can do nothing else but increase their selling prices.

The admiral's statement was the first pronouncement by a major producer on the subject, although it is known that all steel companies have been studying their cost-price structure in view of rising costs. The pension-insurance concessions to employees will add to the burden, beginning Jan. 1, 1950. Some smaller producers already have boosted some prices on products including strip, wire electrical sheets, galvanized sheets and plate.

Admiral Moreell pointed out that J. & L. is just as much interested as anybody in keeping prices down, but the money to pay wages, dividends and maintenance of company properties must come from

some place. The tax laws, he said, don't allow enough for "depreciation and depletion," so funds for repairs must come, in part, from earnings.

The admiral said:

"Despite efforts to resist cost increases, they are now again rising. We see increases in charges for our raw materials, for transportation and other services, and for labor . . . heavy expenditures . . . for plant improvements . . . [which] must be balanced by corresponding increases in prices.

"My feeling is that unless there is a sharp reversal of the current trend of cost increases, we must have an upward revision of our steel price structure. What form this revision will take, the particular products to which it will apply, and the amounts of the increases, should be determined only after the most careful study of costs and the present and prospective demand for our products."

Steel Price Control Ends In Canada; Scrap Stays On

Toronto — Canada abandoned price controls on iron and steel products effective Dec. 1. K. W. Taylor, chairman of the Wartime Prices and Trade Board, announced that under Order No. 783, maximum prices for basic iron and steel products were suspended from price control, and Order No. 785, maximum wholesale prices for primary iron and steel products were also suspended from price control. Steel scrap prices are still controlled.

A check with producers following this announcement, showed that no price advances are under consideration at this time. The 10-pct increase in the cost of raw material imported from the United States due to dollar devaluation is being absorbed by producers here and not passed along to consumers.

Against possible expectations of higher steel prices in Canada is the announcement that the surcharge on nails has been removed, and as a result nail prices here have been reduced 35 cents per 100 lb keg.



"I was afraid it would freeze up during this cold weather, so I put a little alcohol in it."

Structural Steel Bookings Increase

October bookings totaled 158,120 tons and are highest reported for 1949 . . . Shipments are 41 pct under previous month.

New York—The estimated total bookings of fabricated structural steel for the month of October, according to reports received by the American Institute of Steel Construction, Inc., totaled 158,120 tons, and were the highest reported for 1949.

Due to the effects of the steel strike, October shipments dropped to 95,350 tons, or 41 pct less than for the month of September. Shipments for the first 10 months of 1949 amounted to 1,596,394 tons as compared with 1,641,736 tons for the corresponding period of 1948.

The backlog (tonnage available for future fabrication) for the next 4 months only, has increased to 583,580 tons.

The complete tabulation of bookings and shipments, follows:

Estimated Total Tonnage for the Entire Industry			
	1949	1948	Avg. 1936/1940
CONTRACTS CLOSED			
Jan.	130,418	160,634	107,578
Feb.	108,764	130,119	96,280
Mar.	149,079	213,123	124,558
Apr.	98,802	154,082	110,783
May	116,975	141,764	126,237
June	96,932	162,367	125,835
July	126,235*	177,687	152,481
Aug.	98,953*	172,485	113,135
Sept.	120,373*	180,422	137,982
Oct.	158,120	162,739	141,557
Totals	1,204,691	1,655,422	1,236,426
SHIPMENTS			
Jan.	152,746	146,363	92,578
Feb.	145,879	141,556	88,626
Mar.	185,385	167,029	115,031
Apr.	179,206	166,687	123,650
May	171,101	186,915	123,225
June	172,260	157,109	129,969
July	147,960*	160,780	127,422
Aug.	183,868*	176,306	136,389
Sept.	162,139*	174,967	137,255
Oct.	95,350	161,024	140,944
Totals	1,596,394	1,641,736	1,215,089
TONNAGE AVAILABLE FOR FABRICATION WITHIN THE NEXT 4 MONTHS			
	583,580	669,092	348,056

*Revised

Fabricated steel awards this week included the following:

- 9900 Tons, Sacramento, Calif., steel towers, etc., for Shasta-Tracy West Side lines, Central Valley Project, Bureau of Reclamation, Spec. No. R2-74, to Bethlehem Pacific Coast Steel Corp.
- 900 Tons, Frederick Junction, Md., Monocacy River bridge, Maryland State Roads Commission, to American Bridge Co., Pittsburgh.
- 580 Tons, Carbondale, Pa., Catholic youth center, to American Bridge Co., Pittsburgh.

- 400 Tons, Cambridge and Boston, Mass., new Eliot Bridge, of steel, concrete and brick, Munroe Langstroth, Inc., North Attleboro, Mass., low bidder.
- 225 Tons, Denver, spillway stop logs and lifting beam for Davis Dam Project, Bureau of Reclamation, Spec. A-747B-A, to Bethlehem Steel Co., San Francisco.
- 215 Tons, Boston, Reconstruction of bridges and approaches, Park Drive, Back Bay to Medfield St., Fred D. Sabin, Cambridge, Mass., district engineer.
- 160 Tons, YM & YWHA building, Mount Vernon, N. Y., to Grand Iron Works, Inc., N. Y.
- 150 Tons, Philadelphia, roadway expansion dams, Delaware River Bridge, American Bridge Co., low bidder.
- 110 Tons, Sellersville, Pa., nurses home for Grand View Hospital, to Bethlehem Fabricators, Inc., Bethlehem.

Fabricated steel inquiries this week included the following:

- 2800 Tons, Philadelphia, hospital for Veteran's Administration, bids extended to Dec. 13.
- 695 Tons, Santa Barbara, Calif., Tecolote Tunnel, Bureau of Reclamation, Goleta, Calif., Spec. 2851, bids to Dec. 29.
- 300 Tons, Northampton County, Pa., bridge, Pennsylvania Dept. of Highways, due Dec. 21.

Reinforcing bar awards this week included the following:

- 950 Tons, Milwaukee, building for Miller Brewing Co., to W. A. Pipkorn, Milwaukee.

Gets Ford Building Contract

Buffalo—Bryant & Detwiler, Detroit, have been awarded the general contract for the new \$35 million plant to be constructed by the Ford Motor Co. on a site adjacent to the Bethlehem Steel Co.'s Lackawanna plant. As previously reported, the Bethlehem Steel Co. is supplying the 11,500 tons of structural steel.

Rural Electrification Gains

Washington—About 910,000 miles of power lines have been constructed since 1936 with the aid of Rural Electrification Administration financing amounting to \$1.9 billion.

Approximately 80 pct of the nation's farms are now electrified or have service available, the Agriculture Dept. estimates. Three million consumers were using REA power as of Dec. 1, and systems aided by the government agency

- 695 Tons, Chicago, Veterans General Hospital, through J. L. Simmons Co., to J. T. Ryerson & Son, Chicago.
- 350 Tons, Attleboro, Mass., bituminous macadam roadway, Westcott Construction Co., North Attleboro, Mass., awarded contract. F. A. Chase, Taunton, engineer. Completion date, Nov. 22, 1950.
- 265 Tons, Cambridge and Boston, Mass., new Eliot Bridge of steel, concrete and brick, Munroe Langstroth, Inc., North Attleboro, Mass., low bidder.
- 235 Tons, Madison, Wis., West Side elementary school, through J. P. Cullen, Janesville, Wis., to Ceco Steel Products Co., Chicago.
- 195 Tons, Rockford, sewage treating plant to Bethlehem Steel Co., Bethlehem.
- 175 Tons, Virginia, Minn., Sherman Mine building to U. S. Steel Supply Co., Chicago.
- 160 Tons, Chicago, South Shore Drive apartments, to J. T. Ryerson & Son, Chicago.
- 145 Tons, Chicago, building for Central States Building & Realty Co., to Dean Steel Co., Chicago.
- 115 Tons, Onotona, Minn., school to Ceco Steel Products Co., Chicago.
- 100 Tons, Cook County, Ill., Winnetka grade separation to J. T. Ryerson & Son, Chicago.

Reinforcing bar inquiries this week included the following:

- 1160 Tons, Kansas City, Southwest traffic way.
- 1000 Tons, Philadelphia, hospital for Veteran's Administration, bids extended to Dec. 13.
- 440 Tons, Elmhurst, N. J., New Jersey Turnpike contract 1(6), due Dec. 20.
- 350 Tons, Philadelphia, Youth Study Center, City of Philadelphia, due Dec. 14.
- 230 Tons, Minneapolis, class room building for University of Minnesota.
- 200 Tons, Wayzata, Minn., school building.
- 170 Tons, Rochester, Minn., hospital building.
- 120 Tons, San Bernardino Co., Calif., highway construction, Mill Creek, San Bernardino National Forest, Bureau of Public Roads, San Francisco, bids to Dec. 13.
- 100 Tons, Morehead, Minn., water works.
- 100 Tons, Fremont, Minn., Lincoln School building.

were increasing users at the rate of 45,000 monthly.

About 25 commercial companies received financial aid from REA out of 1059 borrowers comprising 973 power systems. Borrowers include 969 cooperatives.

Develops New Auto Engine

Palo Alto, Calif.—Engineers at Stanford University here reportedly believe they can develop a new type of automobile engine out of the "free piston" diesel compressor which was taken from a German submarine and turned over to Stanford for study by the office of Naval research. Tests are under the direction of Prof. A. L. London who reports that the engine would use hot gases to turn a turbine and that it could utilize low-grade fuels. Advantages claimed for such an engine is that it would be light, almost free of vibration and could be built relatively cheaply with low operation and maintenance costs.

Briefs and Bulletins

extends delivery—Because of steel strike disruptions, ECA has extended delivery dates on iron and steel mill materials, products, ferroalloys and other goods covered by ECA Commodity Code Nos. 660 and 680. Third quarter deliveries are extended through Mar. 31, 1950, on contracts made prior to Oct. 1; fourth quarter deliveries are extended through June 30 on contracts made prior to Jan. 1; deliveries specified as prior to June 30 may be made until July 1, provided contracts were made prior to Mar. 1.

auto schedules—Plans call for a gradual increase in auto output that will reach a zenith in March. By then General Motors looks good for a bump of 25 to 30 pct over the October peak for each division. Ford is more ambitious. Production at the Rouge was cut back in November and December, partly for model change. Ford expects to be back at the October level before the end of January and to hit a new high in March. Present plans call for better than 6000 units a day in March.

booming—Business in the Pittsburgh district is even better than it was before the steel and coal strikes. The University of Pittsburgh Bureau of Business Research reports that it is 10 pct higher than the prestrike level and better than in any week since the end of May. The bureau's seasonally adjusted index was 172.1 pct of the 1935-39 average, compared with 156.1 in the week before the coal and steel walkouts.

electrical sheets—Last week Follansbee Steel Corp. raised prices \$35 a ton on all grades of silicon sheets. The increase makes the base price for 24-gage electrical grade \$154 a ton. M. A. Follansbee, president said the increase resulted solely from increased cost of materials and did not reflect pension and insurance cost increases for workers under the company's new labor contract.

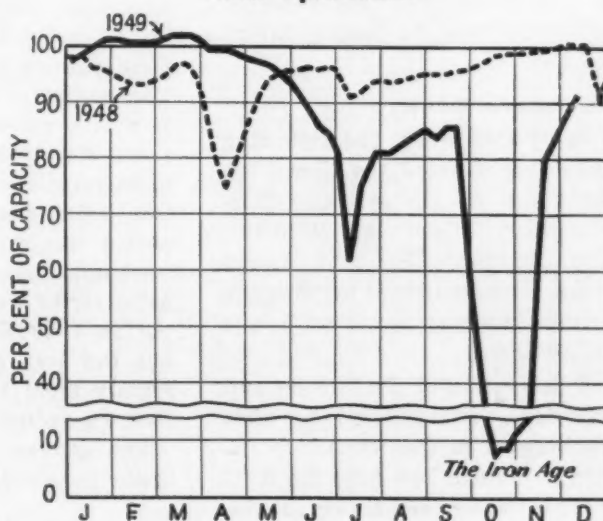
oil goods—Open space is available on some welded linepipe mills for the second and third quarter of 1950. Casing is picking up, inventories are depleted. Best promise out of the Chicago 160-in. plate mill is late March.

construction—New construction valued at more than \$1.7 billion was put in place during November, the Bureau of Labor Statistics estimates. This is 6 pct more than the same month in 1948. Total for 11 months amounted to \$17.7 billion, up 2 pct over 1948. This assures a record year. The gain is attributed almost entirely to increased public works programs of states and municipalities. Privately financed building is running 5 pct behind last year while publicly financed work has risen 25 pct.

operating—Hotpoint started operations in their Cicero range plant last week. They expect to have the world's largest electric range plant working at 50 pct of capacity this week. Return to full operations depends on how well the mills resume shipment of cold-rolled sheets.

galvanized sheets—Continental Steel Corp. last week became the second producer to raise galvanized sheet prices since the steel strike started, and the seventh to announce an increase on one or two products. Culvert, roofing and galvanized sheet prices are unchanged.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
November 27...	90.0*	92.5*	78.5*	82.0	102.0*	101.0	104.0	103.0	95.0	86.0	52.0	84.5	112.5	88.5*
December 4....	93.0	94.5	77.5	85.0	104.0	106.0	103.0	103.0	99.0	94.0	85.5	91.5	112.5	92.0

* Revised.

Nonferrous METALS OUTLOOK

Market Activities

Downward movement in tin continues . . . Tin reduced another 4¢ . . . Strike at Selby refinery may affect lead market . . . Quicksilver cartel threatened.



by

John Anthony

New York—The metal markets were quiet last week, but there were no further declines in price except for the long expected downward movement in tin. Early last week the tin market had been improving, but when the RFC announced a reduction of 2¢ on Thursday and another 2¢ on Friday, the market dried up completely. On Monday, it was reported that there was no buying during the day.

Tin Futures Down

Early this week, the following prices represented the New York equivalent of tin arrivals: Mid-December, 79¼¢; late January, 76¢; February, 75¢; and March, 74½¢. The settlement price of the British Ministry for Dec. 5 was set at 79½¢.

A delegation of tin brokers and importers is scheduled to visit Washington in the immediate future to inquire how long the RFC will continue to sell tin on the domestic market. These factors see the government's tin marketing activities as competitive with private business, and not within the concept of the continued operation of the Texas City smelter.

The lead market continued very quiet last week. But a strike at the Selby, Calif., refinery of the

NONFERROUS METALS PRICES

	Nov. 30	Dec. 1	Dec. 2	Dec. 3	Dec. 5	Dec. 6
Copper, electro, Conn.	18.50	18.50	18.50	18.50	18.50	18.50
Copper, Lake, Conn.	18.025	18.025	18.025	18.025	18.025	18.025
Tin, Straits, New York ...	85.00	83.00	81.00	81.00	81.00	81.00
Zinc, East St. Louis	9.75	9.75	9.75	9.75	9.75	9.75
Lead, St. Louis	11.80	11.80	11.80	11.80	11.80	11.80

Note: Quotations are going prices.

American Smelting & Refining Co. offered some prospect of complete change in the lead market. The output of the Selby refinery is small, rated at 72,000 tons a year. Provided the strike is confined to this refinery, the loss of this metal even for an extended period would mean little to the market in its present position. The Selby strike would be of most importance to western consumers, but the loss could be made up readily from the output of mid-western refineries.

The danger to the market lies in the possibility of the spread of

the strike to other A, S & R refineries who have the same union. Refineries which might be affected would include Omaha, Neb., with a rated output of 200,000 tons; and Barber, N. J., with an output of 144,000 tons. A spread of the strike could strengthen the lead market over night. But so far, there has been no indication of heavier buying.

Quicksilver Cartel Fend

There is a strong probability of the breakup of the international quicksilver cartel, Mercurio Europa. It is learned that a serious disagreement has developed between the Italian and Spanish members of the cartel, originating in the heavy imports of Italian mercury to the United States in the last half of the year. Spanish quicksilver imports are reported to have been very much smaller. The Italian sales were reported to have been at prices below the cartel level.

MONTHLY AVERAGE PRICES

The average prices of the major non-ferrous metals in November based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley.	18.42
Lake copper, Conn. Valley.....	18.55
Straits tin, New York	90.100
Zinc, East St. Louis	9.730
Zinc, New York	10.450
Lead, St. Louis	12.320
Lead, New York	12.522

Mill Products

Aluminum

(Base prices, cents per pound, base 20,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 62S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 76S-O, 76S-OAL, 36.3¢; 0.081 in., 2S, 27.9¢; 4S, 61S-O, 30.2¢; 62S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 76S-O, 76S-OAL, 38¢; 0.032 in., 2S, 28.5¢; 4S, 61S-O, 33.5¢; 62S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 76S-O, 76S-OAL, 47.6¢.

Plate: ¼ in. and heavier: 2S, 3S, F, 23.9¢; (S-F, 26¢; 62S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 76S-F, 76S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 25, 36.7¢ to 1.05; 35 to 37, 44¢ to 1.53; 47 to 49, 43.5¢ to 1.20.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Drawn, ¼ to 1 1/8 in., 11S-T3, R317-T4, 49¢ to 38¢; cold-finished, ¼ to 1 1/8 in., 11S-T3, R317-T4, 37.5¢ to 35.5¢; ½ to 2 in., R317-T4, 37.5¢ to 34.5¢; rolled, 1 1/8 to 1 in., 11S-T3, 35.5¢ to 32.5¢; 2 1/4 to 3 1/2 in., R317-T4, 33.5¢ to 32.5¢. Base 5000 lb.

Drawn Wire: Coiled, 0.081 to 0.374 in.: 2S, 36¢ to 26.5¢; 62S, 44¢ to 32¢; 66S, 47¢ to 18.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 14¢; 76S-T6, 76¢ to 58¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb)

Sheets and Plate: Ma, FSA, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 94¢-1.01; 22, 1.12¢-1.31; 24, 1.16¢-1.17¢. Specification grade higher.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1 1/4 to 1.749, 43¢; 2 1/4 to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1 1/4 to 1.749, 44¢; 2 1/4 to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than six indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.4 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.067, ¼ to 5/16, 81.14; 5/16 to ¾, 81.02; ¾ to 1, 78.4; 1 to 2 in., 45¢; 0.065 to 0.082, ¾ to 7/16, 85¢; ¾ to 1, 82¢; 1 to 2 in., 87¢; 0.165 to 0.219, ¾ to 1, 84.5¢; 1 to 2 in., 83¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and bars	56	45
Angles, h-t-rolled	56	45
Plates	58	46
Seamless tubes	59	50
Shot and blocks	40	40

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	32.18		31.78
Copper, h-r		23.03	
Copper, drawn		29.28	
Low brass	30.12	29.81	33.03*
Yellow brass	28.69	28.38	31.70*
Red brass	30.60	30.29	33.51*
Naval brass	33.51	27.57	28.82
Leaded brass		23.19	27.22
Com'l bronze	31.61	31.30	34.27*
Manganese bronze	37.01	30.92	32.42
Phosphor bronze	50.90	51.15	
Muntz metal	31.58	27.14	28.39
Everdur, Hercu-loy, Olym-ple, etc.	37.19	36.14	
Nickel silver, 10 pct	39.66	41.87	46.80
Arch. bronze			27.22

*Seamless tubing.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	32.00
Beryllium copper, 3.75-4.25% Be, dollars per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$52.00
Blsmuth, ton lots	\$2.00
Cadmium, del'd	\$2.00
Cobalt, 97-99% (per lb)	\$1.80 to \$1.87
Copper, electro, Conn. Valley	18.50
Copper, lake, Conn. Valley	18.625
Gold, U. S. Treas, dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$100 to \$110
Lead, St. Louis	11.80
Lead, New York	12.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask f.o.b. New York	\$70 to \$73
Nickel, electro, f.o.b. New York	42.97
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$69 to \$72
Silver, New York, cents per oz.	73.25
Tin, New York	81.00
Zinc, East St. Louis	9.75
Zinc, New York	10.47
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

Remelted Metals

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 Ingot	
No. 115	16.75-18.25
No. 120	16.25-17.75
No. 123	15.75-17.25
80-10-10 Ingot	
No. 305	22.75
No. 315	19.75
88-10-2 Ingot	
No. 210	20.25
No. 215	26.25
No. 245	18.25-21.50
Yellow Ingot	
No. 405	14.25-16.00
Manganese bronze	
No. 421	20.75

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.75-19.25
0.60 copper, max.	18.25-18.75
Piston alloys (No. 122 type)	16.50-17.00
No. 12 alloy (No. 2 grade)	16.25-16.75
108 alloy	16.75-17.50
195 alloy	17.50-18.00
13 alloy	18.50-19.00
AXS-679	16.75-17.50
5% Ti, Aluminum, f.o.b., Eddystone, Pa.	31.00
Low copper	28.00
2% copper	28.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1-95-97 1/2%	17.75-18.50
Grade 2-92-95%	16.75-17.50
Grade 3-90-92%	15.75-16.50
Grade 4-85-90%	15.25-15.75

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	35 1/2
Electrodeposited	29 1/2
Roller, oval, straight, delivered	33
Ball anodes	38 1/2
BRASS, 80-20	
Cast, oval, 15 in. or longer	31 1/2
Zinc, oval, 99.88%, f.o.b. Detroit	17 1/2
Ball anodes	16 1/2
Nickel 99 pct plus	
Cast	59.00
Roller, depolarized	60.00
Cadmium	\$2.15
Silver 999 fine, roller, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46 1/2
Copper sulfate, 99.5 crystals, bbl.	11.10
Nickel salts, single or double, 4-100 lb bags, frt allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz lots, per oz.	59
Sodium cyanide, 98 pct domestic	
200 lb drums	19.25
Zinc sulfate, 89 pct granular	11.00
Zinc cyanide, 100 lb drums	38.00

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1/2¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turn- ings
Copper	15 1/2	14 1/2
Yellow brass	12 1/2	11 1/2
Red brass	14	13 1/2
Commercial bronze	14 1/2	13 1/2
Manganese bronze	12	11 1/2
Leaded brass rod ends	12 1/2	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	14.75
No. 2 copper wire	13.75
Light copper	12.75
Refinery brass	13.00*
Radiators	8.75- 9.00

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	14.75
No. 2 copper wire	13.75
Light copper	12.75
No. 1 composition	12.00-12.25
No. 1 comp. turnings	11.50-11.75
Roller brass	10.00
Brass pipe	10.50
Radiators	9.50
Heavy yellow brass	9.00
Aluminum	
Mixed old cast	10.00-10.50
Mixed old clips	10.00-10.50
Mixed turnings, dry	8.50- 9.00
Pots and pans	10.00-10.50
Low copper	11.50-12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	13	13 1/2
No. 2 heavy copper and wire	12	12 1/2
Light copper	11	11 1/2
Auto radiators (unsweated)	8 1/2	8 1/2
No. 1 composition	10 1/2	10 1/2
No. 1 composition turnings	10	10 1/2
Clean red car boxes	8 1/2	9
Cocks and faucets	8 1/2	9
Mixed heavy yellow brass	6 1/2	7
Old rolled brass	8	8 1/2
Brass pipe	8 1/2	9
New soft brass clippings	10 1/2	11
Brass rod ends	9 1/2	10
No. 1 brass rod turnings	9 1/2	9 1/2

Aluminum

Alum. pistons and struts	4 1/2	5
Aluminum crankcases	7 1/2	8
2S aluminum clippings	10 1/2	11
Old sheet and utensils	7 1/2	8
Borings and turnings		4
Misc. cast aluminum	7 1/2	8
Dural clips (24S)	7 1/2	8

Zinc

New zinc clippings	6	6 1/2
Old zinc	4	4 1/2
Zinc routings	2 1/2	3
Old die cast scrap	3 1/2	3 1/2

Nickel and Monel

Pure nickel clippings	21	23
Clean nickel turnings	14	15
Nickel anodes	20	22
Nickel rod ends	20	22
New Monel clippings	12	14
Clean Monel turnings	8	9
Old sheet Monel	10	12
Old Monel castings	9	10
Inconel clippings	11	13
Nickel silver clippings, mixed	8	10
Nickel silver turnings, mixed	6	7

Lead

Soft scrap, lead	9	9 1/2
Battery plates (dry)	4 1/2	4 1/2

Magnesium

Segregated solids	9	10
Castings	5 1/2	6 1/2

Miscellaneous

Block tin	60	62
No. 1 pewter	38	40
No. 1 auto babbitt	35	37
Mixed common babbitt	9	9 1/2
Solder joints	11 1/2	12
Siphon tops	40	42
Small foundry type	11 1/2	12
Monotype	10 1/2	11
Lino. and stereotype	9 1/2	10 1/2
Electrotype	8 1/2	8 1/2
New type shell cuttings	11 1/2	11 1/2
Hand picked type shells	4	4 1/2
Lino. and stereo. dross	4 1/2	5
Electro. dross	2 1/2	3

MARKETS—PRICES—TRENDS



SCRAP

Iron & Steel

Prices Decline With Market Undertone Weak

The undertone of the market continues weak following last week's break in prices. Reports indicate that the mills have sufficient supplies of scrap on hand and many will not be in the market again until January. Brokers have no difficulty in covering current sales since plenty of material is available. Heavy mill buying during the past month was responsible for the price rise, and now that buying interest is not up to par, prices weakened. Some mills have restricted shipments of scrap until the material can be unloaded from the large number of cars in the yards. Dealers have been moving some of their stocks and others are gambling on another upward movement when the mills again resume their buying. The top quotation of No. 1 steel was off \$2.00 in Chicago and Detroit; in Philadelphia, New York, Cincinnati, St. Louis and Boston it was off \$1.00. THE IRON AGE scrap composite is off \$1.00 this week to \$27.92 per gross ton.

PITTSBURGH—The undertone of the market continued weak, although the price of No. 1 heavy melting remained unchanged at \$32.00 on the basis of sales. The mills apparently had plenty of scrap on hand and felt they were in a

position to keep prices at current levels or perhaps hold out for lower-priced offerings. While the top price of short turnings remained at \$26.00, the market was showing signs of weakness. No. 2 heavy melting and No. 2 bundles were up \$1.00, as were mixed yard cast and heavy breakable cast.

CHICAGO—Small sales were made early this week at \$2.00 below the last price. Some mills have restricted shipments and even some of the earmarked tonnages are held up. Railroad prices reacted and fell \$3.00 to \$4.00 on the average. The declines varied sharply depending on the item. A printing error occurred in last week's published prices on bundles. No. 2 dealers bundles should have read \$24.00 to \$25.00 and No. 1 dealers' bundles \$26.00 to \$27.00. Consensus is that the present weakness is temporary but no one will predict when it will end. It appears the usual good weather is not an important factor in the present price decline.

PHILADELPHIA—Steel grades were bought here at lower prices. The price of No. 1 dropped \$1.00. No. 2 dropped \$1.50. There was no interest in bundles. The cast market is still firm. Sales of yard cast have been reported at \$35.00 and \$36.00. Some dealers are beginning to move tonnage, but others continue to hold back expecting a higher market. Buying interest is on the light side. Chemical borings were sold \$1.00 higher.

NEW YORK—Prices turned weaker here this week as consumer demand for scrap was at a low ebb. There is very little new business and most of the shipments are on old orders. Some of the material in this area is still being shipped to the Pittsburgh district. No. 2 heavy melting is in demand and the price re-

mains unchanged from the previous week. No. 1 steel dropped \$1.00 to \$20.50—\$21.50. The cast grades continue weak and mixed yard cast is off \$2.00.

DETROIT—The scrap market is noticeably weaker here this week and prices of most grades are off \$2.00 per ton. Local mills have withdrawn temporarily and the close of navigation is undoubtedly a factor contributing to the present easiness, according to local trade sources. Some observers here feel the limited production schedules in auto plants for the next 30 days has probably also influenced the attitude of prospective scrap buyers.

CLEVELAND—In the absence of new sales, the scrap market here and in the Valley was unchanged this week. Primarily because major consumers are not buying, the market is weak. But scrap is moving on old orders. Some No. 1 bundles were sold here last week for a reported \$31.00 and \$32.00 which is hardly symptomatic of collapse. Dealers are holding big tonnages with the expectancy that mills will come in early in January but the growing preference of mills for industrial material increases the gamble.

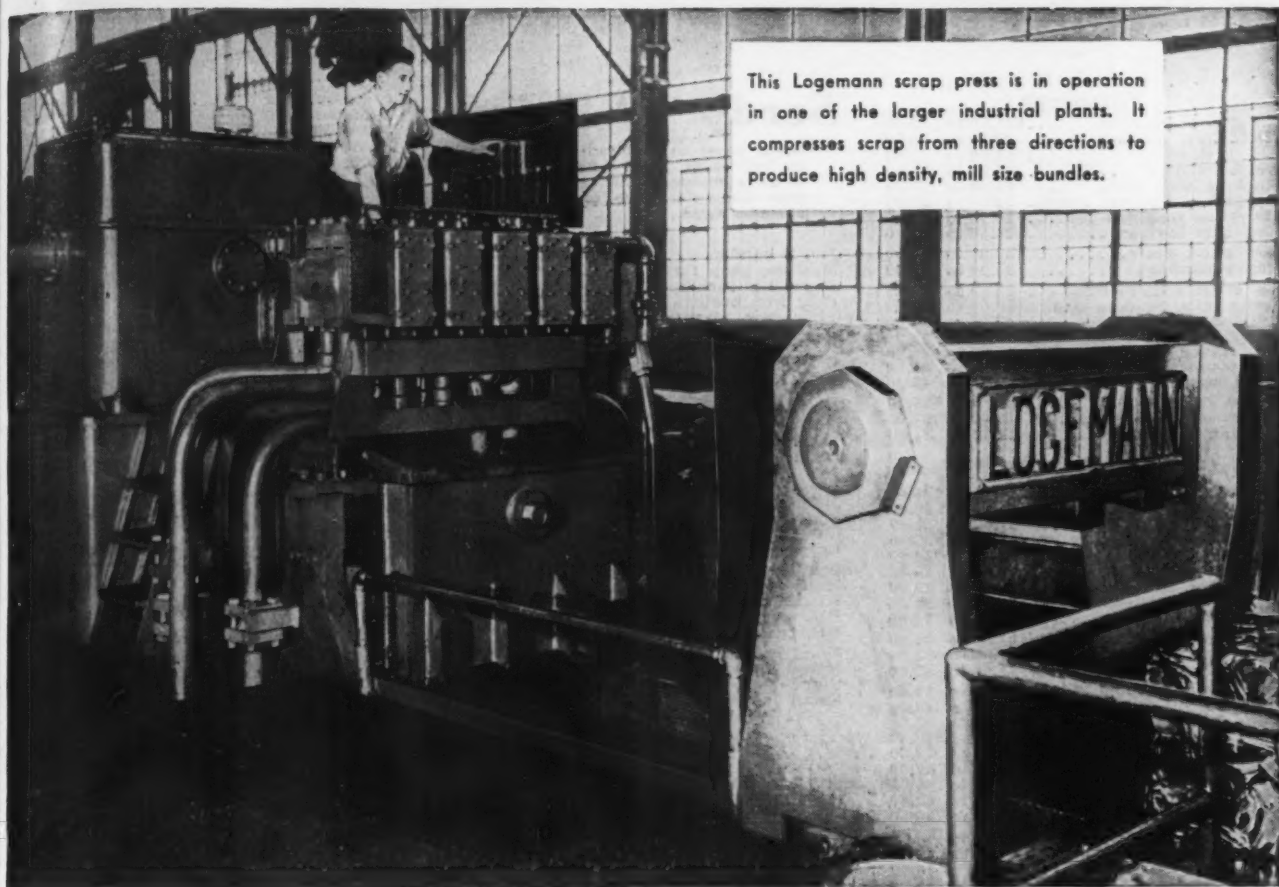
BOSTON: Prices here continued to drop and No. 1 heavy melting steel is off another \$1.00 to \$20.00—\$20.50. Activity is good and the trade is well satisfied with present business. Material is moving freely and no difficulty is being encountered in filling orders. Although the cast situation remains dull there are no price changes in these items.

BUFFALO—While scrap prices were unchanged for the week the market leaned toward the easier side, dealers reported heavy offerings were hanging over the market, making it easy to cover recent sales. Dealers' yard stocks were also building up despite the active movement of material to consumers against old orders. In view of market conditions leading mill consumers preferred a side line position for the moment. Prices held as dealers likewise were holding out for previous levels on new business.

CINCINNATI—With mills out of the market, probably until early next year, price weakness developed in the scrap market here this week. Tonnage is moving on old orders, but mills are comfortable with about a month's inventory on the ground. Dealers are not moving much and holding plenty. Foundry grades are firm at quoted prices, but weakness is expected to develop in these grades unless larger tonnages begin to move.

BIRMINGHAM—Mills in this area are out of the market for openhearth grades of steel and Republic Steel Corp., heaviest consumer of openhearth material in the Birmingham area, plans to buy no more of that material until after the first of the year. Demand also is weak for cast grades and heavy buyer resistance to prices has developed.

ST. LOUIS—Two steel mills made heavy purchases of melting steel during the week at unchanged prices, which brokers and dealers have had no difficulty in covering. It is expected that there will be no more buying until after the turn of the year, and it is believed the edge has been taken off the market. On other melting grades, the market is off \$1.00 a ton, and some foundry grades are lower.



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 3164 W. Burleigh Street • Milwaukee 10, Wisconsin

Pittsburgh

No. 1 hvy. melting	\$31.50 to \$32.00
No. 2 hvy. melting	29.50 to 30.00
No. 1 bundles	31.50 to 32.00
No. 2 bundles	27.50 to 28.00
Machine shop turn.	22.50 to 23.00
Mixed bor. and mss. turns.	22.50 to 23.00
Shoveling turnings	25.50 to 26.00
Cast iron borings	24.50 to 25.00
Low phos. plate	35.00 to 35.50
Heavy turnings	35.00 to 26.00
No. 1 RR. hvy. melting	32.50 to 33.00
Scrap rails, random lgth.	36.00 to 37.00
Rails 2 ft and under	40.00 to 41.00
RR. steel wheels	35.00 to 36.00
RR. spring steel	35.00 to 36.00
RR. couplers and knuckles	35.00 to 36.00
No. 1 machinery cast.	39.00 to 40.00
Mixed yard cast.	36.00 to 37.00
Heavy breakable cast.	30.00 to 31.00
Malleable	33.00 to 34.00

Chicago

No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 factory bundles	27.00 to 28.00
No. 1 dealers' bundles	25.00 to 26.00
No. 2 dealers' bundles	23.00 to 24.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. forge crops	33.00 to 34.00
Low phos. plate	31.00 to 32.00
No. 1 RR. hvy. melting	31.00 to 32.00
Scrap rails, random lgth.	38.00 to 39.00
Rerolling rails	43.00 to 45.00
Rails 2 ft and under	41.00 to 43.00
Locomotive tires, cut	36.00 to 37.00
Cut bolsters & side frames	32.00 to 33.00
Angles and splice bars	35.00 to 36.00
RR. steel car axles	43.00 to 45.00
No. 3 steel wheels	32.00 to 33.00
RR. couplers and knuckles	32.00 to 33.00
No. 1 machinery cast.	42.00 to 43.00
No. 1 agricul. cast.	41.00 to 42.00
Heavy breakable cast.	33.00 to 34.00
RR. grate bars	30.00 to 31.00
Cast iron brake shoes	30.00 to 31.00
Cast iron car wheels	36.00 to 37.00
Malleable	37.00 to 38.00

* Dec. 1 quotation should have read:
No. 1 dealers' bundles 26.00 to 27.00
No. 2 dealers' bundles 24.00 to 25.00

Philadelphia

No. 1 hvy. melting	\$24.00 to \$25.00
No. 2 hvy. melting	22.50 to 23.50
No. 1 bundles	24.00 to 25.00
No. 2 bundles	20.50 to 21.50
Machine shop turn.	16.50 to 17.50
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	17.50 to 18.50
Low phos. punchings, plate	27.50 to 28.50
Low phos. 5 ft and under.	26.00 to 27.00
Low phos. bundles	26.00 to 27.00
Hvy. axle forge turn.	24.00 to 25.00
Clean cast chem. borings.	28.00 to 29.00
RR. steel wheels	29.00 to 29.50
RR. spring steel	29.00 to 29.50
Rails 18 in. and under.	38.00 to 40.00
No. 1 machinery cast	37.00 to 39.00
Mixed yard cast	35.00 to 36.00
Heavy breakable cast.	34.00 to 35.00
Cast iron carwheels	37.00 to 38.00
Malleable	36.00 to 37.00

Cleveland

No. 1 hvy melting	\$30.00 to \$30.50
No. 2 hvy. melting	28.00 to 28.50
No. 1 busheling	30.00 to 30.50
No. 1 bundles	30.00 to 30.50
No. 2 bundles	25.00 to 25.50
Machine shop turn.	19.00 to 19.50
Mixed bor. and turn.	20.50 to 21.00
Shoveling turnings	20.50 to 21.00
Cast iron borings	20.50 to 21.00
Low phos. 2 ft and under.	31.00 to 31.50
Steel axle turn.	29.00 to 29.50
Drop forge flashings	30.00 to 30.50
No. 1 RR. hvy. melting	32.00 to 32.50
Rails 3 ft and under	43.00 to 44.00
Rails 18 in. and under	45.00 to 46.00
No. 1 machinery cast.	45.00 to 46.00
RR. cast.	45.00 to 46.00
RR. grate bars	32.00 to 33.00
Stove plate	36.00 to 37.00
Malleable	39.00 to 40.00

Youngstown

No. 1 hvy. melting	\$32.50 to \$33.00
No. 2 hvy. melting	30.50 to 31.00
No. 1 bundles	32.50 to 33.00

Scrap IRON & STEEL Prices

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

No. 2 bundles	\$27.50 to \$28.00
Machine shop turn.	21.50 to 22.00
Shoveling turnings	23.00 to 23.50
Cast iron borings	23.00 to 23.50
Low phos. plate	33.00 to 34.00

Buffalo

No. 1 hvy. melting	\$29.50 to \$30.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 busheling	27.50 to 28.00
No. 1 bundles	28.50 to 29.00
No. 2 bundles	26.00 to 26.50
Machine shop turn.	20.00 to 20.50
Mixed bor. and turn.	21.00 to 21.50
Shoveling turnings	22.50 to 23.00
Cast iron borings	21.00 to 21.50
Low phos. plate	31.00 to 32.00
Scrap rails, random lgth.	33.50 to 34.00
Rails 2 ft and under	39.50 to 40.00
RR. steel wheels	35.00 to 36.00
RR. spring steel	35.00 to 36.00
RR. couplers and knuckles	35.00 to 36.00
No. 1 cupola cast	36.00 to 37.00
Mixed yard cast	36.00 to 36.50
Stove plate	35.00 to 36.00
Small indus. malleable	24.00 to 24.50

Birmingham

No. 1 hvy. melting	\$27.00
No. 2 hvy. melting	26.00
No. 2 bundles	24.00
No. 1 busheling	26.00
Machine shop turn.	\$16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	17.00
Bar crops and plate	30.00 to 31.00
Structural and plate	30.00 to 31.00
No. 1 RR. hvy. melt.	28.00 to 28.50
Scrap rails, random lgth.	30.00 to 31.00
Rerolling rails	36.00 to 37.00
Rails 2 ft and under	36.00 to 36.50
Angles & splice bars	35.00 to 36.00
Std. steel axles	28.00 to 29.00
No. 1 cupola cast	35.00 to 36.00
Stove plate	28.00 to 29.00
Cast iron carwheels	28.00 to 29.00

St. Louis

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	27.00 to 28.00
No. 2 bundled sheets	26.00 to 27.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	21.00 to 22.00
Rails, random lengths	35.00 to 36.00
Rails 3 ft and under	38.00 to 40.00
Locomotive tires, uncut	30.00 to 31.00
Angles and splice bars	3.00 to 38.00
Std. steel car axles	40.00 to 42.00
RR. spring steel	32.00 to 33.00
No. 1 machinery cast.	36.00 to 37.00
Hvy. breakable cast.	31.00 to 32.00
Cast iron brake shoes	31.00 to 32.00
Stove plate	32.00 to 33.00
Cast iron car wheels	34.00 to 35.00
Malleable	30.00 to 32.00

New York

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$20.50 to \$21.50
No. 2 hvy. melting	19.00 to 20.00
No. 2 bundles	18.00 to 19.00
Machine shop turn.	12.00 to 12.50
Mixed bor. and turn.	12.00 to 12.50
Shoveling turnings	13.00 to 13.50
Clean cast chem. bor.	23.00 to 24.00
No. 1 machinery cast.	30.00 to 31.00
Mixed yard cast.	27.50 to 28.00
Charging box cast.	27.00 to 28.00
Heavy breakable cast.	27.00 to 28.00
Unstrp. motor blocks	24.00 to 25.00

Boston

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$20.00 to \$20.50
No. 2 hvy. melting	16.00 to 17.00
No. 1 bundles	20.00 to 20.50

No. 2 bundles	\$15.50 to \$16.00
Machine shop turn.	11.00 to 11.50
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	12.50 to 13.00
No. 2 bushelings	12.50 to 13.00
Clean cast chem. borings.	18.00 to 19.00
No. 1 machinery cast.	32.00 to 34.00
No. 2 machinery cast.	28.00 to 29.00
Heavy breakable cast.	25.00 to 26.00
Stove plate	25.00 to 26.00

Detroit

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$25.00 to \$26.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 bundles	27.00 to 28.00
New bushelings	26.00 to 27.00
Flashings	25.00 to 26.00
Machine shop turn.	16.50 to 17.50
Mixed bor. and turn.	16.50 to 17.50
Shoveling turnings	18.50 to 19.50
Cast iron borings	18.50 to 19.50
Low phos. plate	27.00 to 28.00
No. 1 cupola cast	37.00 to 38.00
Heavy breakable cast.	30.00 to 31.00
Stove plate	29.00 to 30.00
Automotive cast	37.00 to 38.00

Cincinnati

Per gross ton, f.o.b. cars:	
No. 1 hvy. melting	\$27.00 to \$27.50
No. 2 hvy. melting	25.00 to 25.50
No. 1 bundles	27.00 to 27.50
No. 2 bundles	22.00 to 22.50
Machine shop turn.	15.50 to 16.00
Mixed bor. and turn.	15.50 to 16.00
Shoveling turnings	17.50 to 18.00
Cast iron borings	16.50 to 17.00
Low phos. 18 in. under.	35.00 to 36.00
Rails, random lengths	36.00 to 37.00
Rails, 18 in. and under.	44.00 to 45.00
No. 1 cupola cast	41.00 to 42.00
Hvy. breakable cast	34.00 to 35.00
Drop broken cast	44.00 to 45.00

San Francisco

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	14.00
No. 3 bundles	13.00
Machine shop turn	9.00
Elec. fur 1 ft and under	28.00
No. 1 RR. hvy. melting	20.00
Scrap rails, random lgth.	20.00
No. 1 cupola cast	\$30.00 to 35.00

Los Angeles

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Mach. shop turn.	12.00
Elec. fur. 1 ft and under	30.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast	\$35.00 to 38.00

Seattle

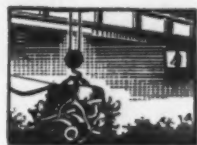
No. 1 hvy. melting	\$18.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Elec. fur. 1 ft and under	\$25.00 to 28.00
RR. hvy. melting	19.00
No. 1 cupola cast	30.00
Heavy breakable cast.	20.00

Hamilton, Ont.

No. 1 hvy. melting	\$24.00
No. 1 bundles	16.00
No. 2 bundles	16.00
Mechanical bundles	22.00
Mixed steel scrap	20.00
Mixed bor. and turn.	18.00
Rails, remelting	24.00
Rails, rerolling	27.00
Bushelings	18.50
Bush., new fact, prep'd.	22.00
Bush., new fact, unprep'd	17.00
Short steel turnings	18.00
Cast scrap	\$40.00 to 43.00

*For the Purchase or Sale of
Iron and Steel Scrap...*

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maintained their leadership in the industry by keeping abreast of
the most modern methods . . . by seeking out the best
markets in every part of the world
. . . by strategically locating their offices to best serve
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LURIA BROTHERS & COMPANY, INCORPORATED

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
(cents per pound)				
Hot-rolled sheets	3.25	3.25	3.25	3.26
Cold-rolled sheets	4.00	4.00	4.00	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.265
Cold-rolled strip	4.038	4.038	4.038	4.063
Plates	3.40	3.40	3.40	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25

Tin and Terneplate:

(dollars per base box)	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
Tinplate (1.50 lb) cokes	\$7.75	\$7.75	\$7.75	\$6.80
Tinplate, electro (0.50 lb)	6.70	6.70	6.70	6.00
Special coated mfg. ternes	6.65	6.65	6.65	5.90

Bars and Shapes:

(cents per pound)	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
Merchant bars	3.35	3.35	3.35	3.37
Cold-finished bars	3.995	3.995	3.995	3.995
Alloy bars	3.75	3.75	3.75	3.75
Structural shapes	3.25	3.25	3.25	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50

Wire:

(cents per pound)	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
Bright wire	4.15	4.15	4.15	4.256

Rails:

(dollars per 100 lb)	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
Heavy rails	\$3.20	\$3.20	\$3.20	\$3.20
Light rails	3.55	3.55	3.55	3.55

Semifinished Steel:

(dollars per net ton)	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
Rerolling billets	\$52.00	\$52.00	\$52.00	\$52.00
Slabs, rerolling	52.00	52.00	52.00	52.00
Forging billets	61.00	61.00	61.00	61.00
Alloy blooms, billets, slabs	63.00	63.00	63.00	63.00

Wire rod and Skelp:

(cents per pound)	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
Wire rods	3.40	3.40	3.40	3.619
Skelp	3.25	3.25	3.25	3.25

Composite Prices

Finished Steel Base Price

Dec. 6, 1949	3.705¢ per lb.
One week ago	3.705¢ per lb.
One month ago	3.705¢ per lb.
One year ago	3.720¢ per lb.

	High	Low
1949....	3.720¢ Jan. 1	3.705¢ May 3
1948....	3.721¢ July 27	3.193¢ Jan. 1
1947....	3.193¢ July 29	2.848¢ Jan. 1
1946....	2.848¢ Dec. 31	2.464¢ Jan. 1
1945....	2.464¢ May 29	2.396¢ Jan. 1
1944....	2.396¢	2.396¢
1943....	2.396¢	2.396¢
1942....	2.396¢	2.396¢
1941....	2.396¢	2.396¢
1940....	2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939....	2.35367¢ Jan. 3	2.26689¢ May 16
1938....	2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937....	2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936....	2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935....	2.07642¢ Oct. 1	2.06492¢ Jan. 8
1934....	2.15367¢ Apr. 24	1.95757¢ Jan. 2
1933....	1.95578¢ Oct. 3	1.75836¢ May 2
1932....	1.89196¢ July 5	1.83901¢ Mar. 1
1931....	1.99626¢ Jan. 13	1.86586¢ Dec. 29
1929....	2.31773¢ May 28	2.26498¢ Oct. 29

Weighted Index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron:	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
(per gross ton)				
No. 2, foundry, Phila.	\$50.42	\$50.42	\$50.42	\$51.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti.	46.08	46.08	46.08	49.47
No. 2, Birmingham	39.38	39.38	39.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	50.76
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese†	173.40	173.40	173.40	161.71

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡Average of U. S. prices quoted on Ferroalloy page.

Scrap:

(per gross ton)	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
Heavy melt'g steel, P'gh.	\$31.75	\$31.75	\$31.75	\$42.75
Heavy melt'g steel, Phila.	24.50	25.50	24.50	44.50
Heavy melt'g steel, Ch'go	27.50	29.50	30.50	41.75
No. 1 hy comp. sh't, Det.	27.50	29.50	25.50	38.00
Low phos. Young'n.	33.75	33.75	33.75	47.75
No. 1, cast, Pittsburgh	39.50	39.50	39.50	70.00
No. 1, cast, Philadelphia	38.00	38.00	37.00	66.50
No. 1, cast, Chicago	42.50	44.50	44.00	71.00

Coke: Connellsville:

(per net ton at oven)	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
Furnace coke, prompt	\$14.00	\$14.00	\$14.25	\$15.00
Foundry coke, prompt	15.75	15.75	15.75	17.00

Nonferrous Metals:

(cents per pound to large buyers)	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
Copper, electro, Conn.	18.50	18.50	18.50	23.50
Copper, Lake Conn.	18.625	18.625	18.625	23.625
Tin Straits, New York	81.00	85.00	94.00	\$1.03
Zinc, East St. Louis	9.75	9.75	9.75	17.50
Lead, St. Louis	11.80	11.80	12.80	21.30
Aluminum, virgin	17.00	17.00	17.00	17.00
Nickel electrolytic	42.97	42.97	42.97	42.90
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	32.00	32.00	32.00	35.00

Starting with the issue of May 12, 1940, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1940 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Pig Iron

	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
.....	\$45.88 per gross ton	\$27.92 per gross ton		
.....	45.88 per gross ton	28.92 per gross ton		
.....	45.88 per gross ton	28.92 per gross ton		
.....	46.91 per gross ton	43.00 per gross ton		

Scrap Steel

	Dec. 6, 1949	Nov. 29, 1949	Nov. 8, 1949	Dec. 7, 1948
.....	\$45.88 per gross ton	\$27.92 per gross ton		
.....	45.88 per gross ton	28.92 per gross ton		
.....	45.88 per gross ton	28.92 per gross ton		
.....	46.91 per gross ton	43.00 per gross ton		

	High	Low		High	Low
46.82 Jan. 4	46.82	45.88 Sept. 6	43.00 Jan. 1	43.00	19.33 June 28
46.91 Oct. 12	46.91	39.58 Jan. 6	43.16 July 27	43.16	39.75 Mar. 9
37.98 Dec. 30	37.98	30.14 Jan. 7	42.58 Oct. 28	42.58	29.50 May 20
30.14 Dec. 10	30.14	25.37 Jan. 1	31.17 Dec. 24	31.17	19.17 Jan. 1
25.37 Oct. 23	25.37	23.61 Jan. 2	19.17 Jan. 2	19.17	18.92 May 22
\$23.61	\$23.61	\$23.61	19.17 Jan. 11	19.17	15.76 Oct. 24
23.61	23.61	23.61	\$19.17	\$19.17	
23.61	23.61	23.61	19.17	19.17	
\$23.61 Mar. 20	\$23.61	\$23.45 Jan. 2	\$22.00 Jan. 7	\$22.00	\$19.17 Apr. 10
23.45 Dec. 23	23.45	22.61 Jan. 2	21.83 Dec. 30	21.83	16.04 Apr. 9
22.61 Sept. 19	22.61	20.61 Sept. 12	22.50 Oct. 3	22.50	14.08 May 16
23.25 June 21	23.25	19.61 July 6	15.00 Nov. 22	15.00	11.00 June 7
23.25 Mar. 9	23.25	20.25 Feb. 16	21.92 Mar. 30	21.92	12.67 June 9
19.74 Nov. 24	19.74	18.73 Aug. 11	17.75 Dec. 21	17.75	12.67 June 8
18.84 Nov. 5	18.84	17.83 May 14	13.42 Dec. 10	13.42	10.33 Apr. 29
17.90 May 1	17.90	16.90 Jan. 27	13.00 Mar. 13	13.00	9.50 Sept. 25
16.90 Dec. 5	16.90	13.56 Jan. 3	12.25 Aug. 8	12.25	6.75 Jan. 3
14.81 Jan. 5	14.81	13.56 Dec. 6	8.50 Jan. 12	8.50	6.43 July 5
15.90 Jan. 6	15.90	14.79 Dec. 15	11.33 Jan. 6	11.33	8.50 Dec. 29
18.71 May 14	18.71	18.21 Dec. 17	17.58 Jan. 29	17.58	14.08 Dec. 8

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.



SCRAP

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IRON AGE

STEEL
PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middle- town	Youngs- town	Bethle- hem	Buffalo	Consho- hocken	Johns- town	Spar- rows Point	Granite City	Detroit
INGOTS														
Carbon forging, net ton	\$50.00 1													\$50.00 21
Alloy net ton	\$51.00 1.17													\$51.00 21
BILLETS, BLOOMS, SLABS														
Carbon, rerolling net ton	\$52.00 1	\$52.00 1	\$52.00 1				\$57.00 13		\$52.00 3	\$57.00 26	\$52.00 3			
Carbon forging billets, net ton	\$61.00 1	\$61.00 1.4	\$61.00 1.8	\$61.00 4			\$61.00 25		\$61.00 2.4	\$63.00 26	\$61.00 3			\$61.00 21
Alloy, net ton	\$63.00 1.17	\$63.00 1.4	\$63.00 1		\$63.00 4.42		\$63.00 18	\$63.00 3	\$63.00 2.4	\$65.00 26	\$63.00 3			\$63.00 21
SHEET BARS							\$57.00 13							
PIPE SKELP	3.25 1.5						3.25 1.4							
WIRE RODS	3.40 2.19	3.40 2.4.23	3.40 6	3.40 2			3.40 6				3.40 3	3.50 3		
SHEETS														
Hot-rolled (18 ga. & hvr.)	3.25 1.5.9.15	3.25 22	3.25 1.6.8	3.25 4.5			3.25 1.4.6.12		3.25 3	3.35 26		3.25 3		3.45 12
Cold-rolled	4.00 ^{1.5} 7.9.15.63		4.00 1.6.8	4.00 4.5		4.00 7	4.00 4.6		4.00 3			4.00 3	4.20 22	4.20 12
Galvanized (10 gage)	4.40 1.9.15		4.40 1.8		4.40 4		4.40 ^{6.4} 5.65 ^{1.1}					4.40 3		
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4		4.40 7	4.40 6						4.60 22	4.70 12
Long ternes (10 gage)	4.80 9.15		4.80 1			4.80 7								
Hi Str. low alloy, h.r.	4.95 1.5.9	4.95 1	4.95 1.6.8	4.95 4.5			4.95 1.4.6.12		4.95 3	4.95 26		4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.05 1.5		6.05 1.6.8	6.05 4.5			6.05 4.6.12		6.05 3			6.05 3		6.25 12
Hi Str. low alloy, galv.	6.75 1			6.75 4	6.75 4							6.75 3		
STRIP														
Hot-rolled (over 6 in.)	3.25 5.7.9.23	3.25 22.66	3.25 1.6.8	3.25 5			3.25 1.4.6.12		3.25 3			3.25 3		3.45 12.47
Cold-rolled	4.00 5.7.9.63	4.15 66	4.00 3	4.00 2.5		4.00 7	4.00 4.6.12.40.43.49		4.00 3			4.00 3		4.20 ^{12.47} 4.25 ^{14.41}
Hi Str. low alloy, h.r.	4.95 5		4.95 1.6.8	4.95 5			4.95 1.4.6.12		4.95 3			4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.05 5.9			6.05 2.5			6.05 4.6.12		6.05 3			6.05 3		6.25 12
TINPLATE¹														
Coke, 1.50-lb, base box	\$7.75 1.5.9.15		\$7.75 1.6.8				\$7.75 4					\$7.85 3	\$7.95 22	
Electrolytic 0.25, 0.50, 0.75 lb box														
	Deduct \$1.30, \$1.05 and 75¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage														
Hollowware enameling	5.30 1.5.15		5.30 1.6.8				5.30 4					5.40 3	5.50 22	
BAR														
Carbon steel	3.35 1.5.9.17	3.35 1.4.23	3.35 1.6.8	3.35 4	3.35 4		3.35 1.4.6		3.35 2.4		3.35 3			3.55 12
Reinforcing ²	3.35 1.5	3.35 4	3.35 1.6.8	3.35 4	3.35 4		3.35 1.4.6		3.35 2.4		3.35 3	3.35 3		
Cold-finished	3.95 ⁵ 4.00 ^{2.4} 17.52.69.71	4.00 ² 23.69.70	4.00 4.73.74	4.00 2.61	4.00 4.33		4.00 6.40.57		4.00 70					4.30 12
Alloy, hot-rolled	3.75 1.17	3.75 1.4.23	3.75 1.6.8		3.75 4.42		3.75 1.6.25	3.75 2	3.75 2.4		3.75 3			4.05 12
Alloy- cold-drawn	4.65 2.17.63.69.71	4.65 2.23.69.70	4.65 4.73.74	4.65 2.61	4.65 4.43.52		4.65 6.33.57	4.65 2	4.65 2.70					
Hi Str. alloy, h.r.	5.10 1.5		5.10 1.6.8	5.10 4			5.10 1.6	5.10 3	5.10 3		5.10 3			5.30 12
PLATE														
Carbon Steel	3.40 1.5	3.40 1	3.40 1.6.8	3.40 4			3.40 13		3.40 3	3.50 26	3.40 3	3.40 3		3.65 2
Floor plates	4.55 1	4.55 1	4.55 3	4.55 5					4.55 26					
Alloy	4.40 1	4.40 1	4.40 1				4.40 13		4.40 26	4.40 26	4.40 3	4.40 3		
Hi St. low alloy	5.20 1.5	5.20 1	5.20 1.3	5.20 4.5			5.20 6			5.20 26	5.20 3	5.20 3		5.45 12
SHAPES, Structural														
Hi Str. low alloy	4.95 1.5.9	4.95 1.23	4.95 1.6.8				4.95 6	5.05 3	5.05 3		5.05 3			
MANUFACTURERS' WIRE														
Bright	4.15 2.5.18	4.15 ² 4.33.34		4.15 2.77			4.15 6				4.15 3	4.25		Duluth=4.15 ³ Pueblo=4.50 ^{1.4}
PILING. Steel sheet	4.05 1.9	4.05 1							4.05 3					

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

KEY TO STEEL PRODUCERS

With Principal Offices

- 1 Carnegie-Illinois Steel Corp., Pittsburgh
- 2 American Steel & Wire Co., Cleveland
- 3 Bethlehem Steel Co., Bethlehem
- 4 Republic Steel Corp., Cleveland
- 5 Jones & Laughlin Steel Corp., Pittsburgh
- 6 Youngstown Sheet & Tube Co., Youngstown
- 7 Armco Steel Corp., Middletown, Ohio
- 8 Inland Steel Co., Chicago
- 9 Weirton Steel Co., Weirton, W. Va.
- 10 National Tube Co., Pittsburgh
- 11 Tennessee Coal, Iron & R. R. Co., Birmingham
- 12 Great Lakes Steel Corp., Detroit
- 13 Sharon Steel Corp., Sharon, Pa.
- 14 Colorado Fuel & Iron Corp., Denver
- 15 Wheeling Steel Corp., Wheeling, W. Va.
- 16 Geneva Steel Co., Salt Lake City
- 17 Crucible Steel Co. of America, New York
- 18 Pittsburgh Steel Co., Pittsburgh
- 19 Kaiser Co., Inc., Oakland, Calif.
- 20 Portsmouth Steel Corp., Portsmouth, Ohio
- 21 Lukens Steel Co., Coatsville, Pa.
- 22 Granite City Steel Co., Granite City, Ill.
- 23 Wisconsin Steel Co., South Chicago, Ill.
- 24 Columbia Steel Co., San Francisco
- 25 Copperweld Steel Co., Glassport, Pa.
- 26 Alan Wood Steel Co., Conshohocken, Pa.
- 27 California Cold Rolled Steel Corp., Los Angeles
- 28 Allegheny Ludlum Steel Corp., Pittsburgh
- 29 Worth Steel Co., Claymont, Del.
- 30 Continental Steel Corp., Kokomo, Ind.
- 31 Rotary Electric Steel Co., Detroit
- 32 Laclede Steel Co., St. Louis
- 33 Northwestern Steel & Wire Co., Sterling, Ill.
- 34 Keystone Steel & Wire Co., Peoria, Ill.
- 35 Central Iron & Steel Co., Harrisburg, Pa.
- 36 Carpenter Steel Co., Reading, Pa.
- 37 Eastern Stainless Steel Corp., Baltimore
- 38 Washington Steel Corp., Washington, Pa.
- 39 Jessop Steel Co., Washington, Pa.
- 40 Blair Strip Steel Co., New Castle, Pa.
- 41 Superior Steel Corp., Carnegie, Pa.
- 42 Timken Steel & Tube Div., Canton, Ohio
- 43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
- 44 Reeves Steel & Mfg. Co., Dover, Ohio
- 45 John A. Roebling's Sons Co., Trenton, N. J.
- 46 Simonds Saw & Steel Co., Fitchburg, Mass.
- 47 McLouth Steel Corp., Detroit
- 48 Cold Metal Products Co., Youngstown
- 49 Thomas Steel Co., Warren, Ohio
- 50 Wilson Steel & Wire Co., Chicago
- 51 Sweet's Steel Co., Williamsport, Pa.
- 52 Superior Drawn Steel Co., Monaca, Pa.
- 53 A. M. Byers Co., Pittsburgh
- 54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
- 55 Ingersoll Steel Div., Chicago
- 56 Latrobe Electric Steel Co., Latrobe, Pa.
- 57 Fitzsimons Steel Co., Youngstown
- 58 Stanley Works, New Britain, Conn.
- 59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
- 60 Vanadium-Alloys Steel Co., Latrobe, Pa.
- 61 Cuyahoga Steel & Wire Co., Cleveland
- 62 Bethlehem Pacific Coast Steel Corp., San Francisco
- 63 Follansbee Steel Corp., Pittsburgh
- 64 Niles Rolling Mill Co., Niles, Ohio
- 65 Atlantic Steel Co., Atlanta
- 66 Acme Steel Co., Chicago
- 67 Joslyn Mfg. & Supply Co., Chicago
- 68 Detroit Steel Corp., Detroit
- 69 Wyckoff Steel Co., Pittsburgh
- 70 Bliss & Laughlin, Inc., Harvey, Ill.
- 71 Columbia Steel & Shaffing Co., Pittsburgh
- 72 Cumberland Steel Co., Cumberland, Md.
- 73 La Salle Steel Co., Chicago
- 74 Monarch Steel Co., Inc., Indianapolis
- 75 Empire Steel Co., Mansfield, Ohio
- 76 Mahoning Valley Steel Co., Niles, Ohio
- 77 Oliver Iron & Steel Co., Pittsburgh
- 78 Pittsburgh Screw & Bolt Co., Pittsburgh
- 79 Standard Forgings Corp., Chicago
- 80 Driver Harris Co., Harrison, N. J.
- 81 Detroit Tube & Steel Div., Detroit
- 82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
- 83 Sheffield Steel Corp., Kansas City

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
				INGOTS	Carbon forging, net ton
					Alloy, net ton
	\$59.00 83			BILLETS, BLOOMS, SLABS	Carbon, re-rolling, net ton
		\$52.00 11	F = \$71.00 ¹⁹		Carbon forging billets, net ton
	\$69.00 83	\$61.00 11	F = \$80.00 ¹⁹	Geneva = \$61.00 ¹⁶	Alloy net ton
	\$71.00 83		F = \$82.00 ¹⁹		
				Mansfield = \$58.00 G. T. ⁷⁵ Portsmouth = \$55.00 ²⁰	SHEET BARS
					PIPE SKEL
	3.95 83		SF, LA = 4.05 ²⁴ LA = 4.20 ²²	Portsmouth = 3.40 ²⁰ Worcester = 3.70 ²	WIRE RODS
		3.25 4.11	LA = 3.95 ²⁴ F = 4.15 ¹⁹	Kokomo, ³⁰ Ashland ⁷ = 3.25	SHEETS
		4.00 11	SF = 4.95 ²⁴ F = 4.90 ¹⁹		Hot-rolled (18 ga. & hvr.)
		4.40 4.11	SF, LA = 5.15 ²⁴	Ashland = 4.40 ⁷ Kokomo = 4.80 ³⁰	Cold-rolled
					Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		4.95 11			Hi Str. low alloy, h.r.
					Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85 83	3.65 83	3.25 11	SF, LA = 4.00 ²² F = 4.40 ¹⁹ , S = 4.25 ²²	Ashland = 3.25 ⁷ Atlanta = 3.40 ⁶⁵	STRIP
			F = 4.90 ¹⁹ LA = 5.00 ²⁷	New Haven = 4.50 ^{2,68}	Hot-rolled
		4.95 11			Cold-rolled
					Hi Str. low alloy, h.r.
			F = 6.95 ¹⁹		Hi Str. low alloy, c.r.
		\$7.85 11	SF = \$8.50 ²⁴		TINPLATE
Deduct \$1.30, \$1.05 and 75¢ respectively from 1.50-lb coke base box price					Cokes, 1.50-lb, base box
					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
3.95 83	3.75 83	3.35 4.11	SF, LA = 4.05 ²⁴ LA = 4.05 ²²	Atlanta = 3.50 ⁶⁵	BARS
3.95 83	3.75 83	3.35 4.11	SF, S = 4.10 ⁶² F = 4.00 ¹⁹	Atlanta = 3.50 ⁶⁵	Carbon steel
				Putnam, Newark = 4.40 ⁶⁹ Cumberland = 3.95 ⁷²	Reinforcing†
					Cold-finished
4.35 83			LA = 4.80 ⁶² F = 4.75 ¹⁹		Alloy, hot-rolled
				Newark, ⁶⁹ Worcester ² = 4.95	Alloy, cold-drawn
		5.10 4			Hi Str. low alloy, h.r.
	3.80 83	3.40 4.11	F = 4.00 ¹⁹ S = 4.30 ⁶² Geneva = 3.40 ¹⁶	Claymont = 3.50 ²⁹ Coatesville = 3.50 ²¹ Harrisburg = 3.75 ²⁵	PLATE
				Harrisburg = 4.55 ²⁵	Carbon steel
				Coatesville = 4.50 ²¹	Floor plates
		5.20 11		Geneva = 5.20 ¹⁶	Alloy
3.85 83	3.65 83	3.25 11	SF = 3.80 ⁶² LA = 3.85, ⁶² 3.95 ²⁴		Hi Str. low alloy
		4.95 11	F = 3.80 ¹⁹ S = 3.90 ⁶²		SHAPES, Structural
4.75 83	4.55 83	4.15 4.11	SF, LA = 5.10 ²⁴ LA = 5.10 ²²	Portsmouth = 4.15 ²⁰ Worcester = 4.45 ²	Hi Str. low alloy

Notes: †Special coated mfg ternes, deduct \$1.10 from 1.50-lb coke base box price.
Can-making quality blackplate, 55 to 128-lb, deduct \$2.00 from 1.50-lb coke base box.
†Straight lengths only from producer to fabricator.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column Pittsburg, Calif.
Standard & coated nails*	103
Woven wire fence†	109
Fence posts, carloads††	112
Single loop bale ties	106
Galvanized barbed wire**	123
Twisted barbed wire	123

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15 1/2 gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet and Johnstown.

	Base per Pittsburg, 100 lb	Calif.
Annealed fence wire†	\$4.80	\$5.75
Annealed, galv. fencing†	5.25	6.20
Cut nails, carloads††	6.75	

† Add 30¢ at Worcester; 10¢ at Sparrows Pt.
†† Less 20¢ to jobbers.

PRODUCING POINTS — Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire: Alabama City, Ala., 4; Atlanta, 65; Allquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City (except bale ties), 83.

Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.
Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill		
Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. (21)	*26.50	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)		*22.50
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon		
10 pct, Coatesville, (26)	27.50	
Inconel-carbon		
10 pct, Coatesville, (21)	36.00	
Monel-carbon		
10 pct, Coatesville, (21)	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (41)		75.00
Aluminized steel sheets, hot dip, Butler, Pa., (7)		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

24 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	5.45
Electrical	5.95
Motor	6.70
Dynamo	7.50
Transformer 72	8.05
Transformer 65	8.60
Transformer 58	9.30
Transformer 52	10.10

PRODUCING POINTS—Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Folsom, W. Va., 63, add 1.75¢; Granite City, Ill., 22; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Toronto, Ohio, 63; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount less case lots

Machine and Carriage Bolts

	Pct Off List
1/2 in. & smaller x 6 in. & shorter	35
9/16 & 5/8 in. x 6 in. & shorter	37
3/4 in. & larger x 6 in. & shorter	34
All diam., longer than 6 in.	30
Lag, all diam over 6 in. & longer	35
Lag, all diam x 6 in. & shorter	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

1/2 in. and smaller	35
9/16 to 1 in. inclusive	34
1 1/8 to 1 1/2 in. inclusive	32
1 3/4 in. and larger	27
On above bolts and nuts, excepting plow bolts, additional allowances of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

Semifinished Hexagon Nuts

	USS	SAE
7/16 in. and smaller	41	
1/2 in. and smaller	38	
1/2 in. through 1 in.	39	
9/16 in. through 1 in.	37	
1 1/8 in. through 1 1/2 in.	35	37
1 3/4 in. and larger	28	
In full case lots, 15 pct additional discount.		

Stove Bolts

Packages, nuts separate	\$61.75
In bulk	70.00

Large Rivets

	(1/2 in. and larger) Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

	(7/16 in. and smaller) Pct off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

	Pct Off List
(In packages)	
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
1/4 to 1 in. x 6 in., SAE (1035), heat treated	35
Milled studs	19
Flat head cap screws, listed sizes	5
Fillister head cap, listed sizes	28

C-R SPRING STEEL

	Base per pound f.o.b. mill
0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢
Worcester, add 0.30¢.	

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	\$7.60
Old range, nonbessemer	7.45
Mesabi, bessemer	7.35
Mesabi, nonbessemer	7.20
High phosphorus	7.20
After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.	

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier	
No. 1 quality, per 100 lb	\$3.30
Joint bars, per 100 lb	4.35
Light rails per 100 lb	3.55

	Base Price cents per lb
Track spikes†	5.35
Axles	5.30
Screw spikes	8.00
Tie plates	4.05
Tie plates, Pittsburgh, Torr., Calif.*	4.20
Track bolts, untreated	8.25
Track bolts, heat treated, to railroads	8.50

* Seattle, add 30¢.
† Kansas City, 5.60¢.

PRODUCING POINTS—Standard rails: Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 7, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburgh, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

<i>F.o.b. mill</i>					Base
W	Cr	V	Mo	Co	per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	\$1.42
18	4	2	—	—	\$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢
High-carbon-chromium					52¢
Oil hardened manganese					29¢
Special carbon					26.5¢
Extra carbon					23¢
Regular carbon					19¢

Warehouse prices on and east of Mississippi are 2 1/2¢ per lb higher. West of Mississippi, 4 1/2¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	\$13.50 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$15.50 to \$16.00
Foundry, oven coke	
Buffalo, del'd	\$20.90
Chicago, f.o.b.	20.40
Detroit, f.o.b.	19.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.45
Swedeland, Pa., f.o.b.	20.40
Plainesville, Ohio, f.o.b.	20.90
Erie, del'd	\$20.25 to 21.04
Cleveland, del'd	22.62
Cincinnati, del'd	21.71
St. Paul, f.o.b.	23.50
St. Louis, del'd	21.60
Birmingham, del'd	18.75

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net: Effective CaF ₂ content:	
70% or more	\$37.00
60% or less	34.00

STAINLESS STEELS

Base prices, in cents per pound.
f.o.b. producing point

Product	301	302	303	304	316	321	347	410	418	430
Ingot, rerolling.....	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling.....	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings.....	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging.....	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals.....	28.50	28.50	31.00	30.00	48.00	34.00	38.50	23.00	23.50	23.50
Plates.....	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50	26.50
Sheets.....	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	33.50
Strip, hot-rolled.....	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	26.00	21.75
Strip, cold-rolled.....	30.50	33.00	35.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key on Steel Price Page.

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., 17; Brackenridge, Pa., 38; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, Md., 1; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 49; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 38; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 44; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price, about \$200.00 per net ton

Standard, Threaded and Coupled

Steel, butt weld*	Black	Galv
1/2-in.	43 to 41	26 1/2 to 24 1/2
3/4-in.	46 to 44	30 1/2 to 28 1/2
1-in.	48 1/2 to 46 1/2	33 1/2 to 31 1/2
1 1/4-in.	49 to 47	34 to 32
1 1/2-in.	49 1/2 to 47 1/2	34 1/2 to 32 1/2
2-in.	50 to 48	35 to 33
2 1/2 to 3-in. ..	50 1/2 to 48 1/2	35 1/2 to 33 1/2

Steel, lap weld		
2-in.	39 1/2	26 to 24
2 1/2 to 3-in. ..	43 1/2 to 42 1/2	28 to 27
3 1/2 to 6-in. ..	46 1/2 to 42 1/2	31 to 27

Steel, seamless		
2-in.	38 1/2	23
2 1/2 to 3-in. ..	41 1/2	26
3 1/2 to 6-in. ..	43 1/2	28

Wrought iron, butt weld		
1/2-in.	+20 1/2	+47
3/4-in.	+10 1/2	+36
1 & 1 1/4 in.	+4 1/2	+27
2-in.	+1 1/2	+23 1/2
3-in.	— 2	+23

Wrought iron, lap weld		
2-in.	+7 1/2	+31
2 1/2 to 3 1/2-in.	+5	+26 1/2
4-in.	list	+20 1/2
4 1/2 to 8-in. ..	+2	+22

Extra Strong, Plain Ends

Steel, butt weld		
1/2-in.	42 to 40	27 to 25
3/4-in.	46 to 44	31 to 29
1-in.	48 to 46	34 to 32
1 1/4-in.	48 1/2 to 46 1/2	34 1/2 to 32 1/2
1 1/2-in.	49 to 47	35 to 33
2-in.	49 1/2 to 47 1/2	35 1/2 to 34 1/2
2 1/2 to 3-in. ..	50 to 48	36 to 34

Steel, lap weld		
2-in.	39 1/2 to 38 1/2	25 to 24
2 1/2 to 3-in. ..	44 1/2 to 42 1/2	30 to 28
3 1/2 to 6-in. ..	48 to 44	33 1/2 to 31 1/2

Steel, seamless		
2-in.	37 1/2	23
2 1/2 to 3-in. ..	41 1/2	27
3 1/2 to 6-in. ..	45	30 1/2

Wrought iron, butt weld		
1/2-in.	+16	+40
3/4-in.	+9 1/2	+34
1 to 2-in.	— 1/2	+23

Wrought iron, lap weld		
2-in.	+4 1/2	+27 1/2
2 1/2 to 4-in.	— 5	+16
4 1/2 to 6-in.	— 1	+20 1/2

For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.

OD	Gage	Seamless	Electric Weld
in.	BWG	H.R.	C.D.
2	13	\$19.13	\$22.56
2 1/2	12	25.79	30.33
3	12	28.68	33.76
3 1/2	11	35.85	42.20
4	10	44.51	52.35

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	\$95.70
6 to 24-in., del'd N. Y.	\$92.50 to \$97.40
6 to 24-in., Birmingham	\$2.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	109.30
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

REFRACTORIES (F.o.b. works)

Fire Clay Brick	Carloads, Per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5)	\$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 74.00	
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	11.50

Silica Brick	
Mt. Union, Pa., Ensley, Ala.	\$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	\$85.00 to \$95.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	\$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	\$14.75 to 15.00
Silica cement, net ton, bulk, Utah and Calif.	21.00

Chrome Brick	Per Net Ton
Standard chemically bonded, Balt., Chester	\$69.00

Magnesite Brick	
Standard, Baltimore	\$91.00
Chemically bonded, Baltimore	80.00

Grain Magnesite	Std. 3/4-in. grains
Domestic, f.o.b. Baltimore, in bulk, fines removed	\$56.00 to \$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	30.50 to 31.00
In sacks with fines	35.00 to 35.50

Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10¢; Missouri Valley, add 20¢	\$12.25

METAL POWDERS

	Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.
Swedish sponge iron c.l.f.	
New York, ocean bags	7.4¢ to 9.0¢

Domestic sponge iron, 98+%	
Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+%	
Fe	31.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+%	
Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+%	
Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8+%	
Fe	90.0¢ to \$1.75
Aluminum	29.00¢
Antimony	45.78¢
Brass, 10 ton lots	22.75¢ to 25.75¢
Copper, electrolytic	28.625¢
Copper, reduced	25.50¢
Cadmium	\$2.40
Chromium, electrolytic, 99% min.	\$3.50
Lead	19.02¢
Manganese	55.00¢
Molybdenum, 99%	\$2.65
Nickel, unannealed	61.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.00¢
Tin	96.00¢
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	15.50¢ to 18.25¢

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
GRAPHITE		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2 1/2	24, 30	21.00¢
2	24, 30	23.00¢
CARBON		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	34, 99	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 15c to base price except Cincinnati
and New Orleans (*), add 10c; New York, Chicago and Boston, add 20c).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (16 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.31	6.21-6.41	6.95-7.11	5.37	....	5.56	5.36	5.42	6.18	....	9.80-10.10	....	....
Birmingham	4.85	5.75	6.15	4.85	....	5.10	4.90	4.90	5.59	....	....	....	....
Boston	5.55	6.45-6.75	7.11-7.61	5.60	6.75	5.75	5.42	5.52	6.02	9.36-9.67	9.67-9.87	10.72	11.02
Buffalo	4.85	5.75	7.42-7.57	5.24	7.27	5.35	5.00	4.95	5.40	9.38	9.60	10.65	10.95
Chicago	4.85	5.75	6.85	4.85	5.45-6.15	5.10	4.90	4.90	5.40	8.90	9.20	10.25	10.55
Cincinnati*	5.18-5.51	5.84-6.28	6.59-6.93	5.28-5.43	....	5.53-5.85	5.33	5.33-5.48	6.08-6.20	9.74	9.99	11.19	11.44
Cleveland	4.85	5.75	6.70	5.03	....	5.21	5.01	5.01	5.45	9.05	9.35	10.40	10.70
Detroit	5.28-5.32	6.07-6.18	7.38-7.58	5.27-5.47	6.27-6.58	5.52-5.57	5.33	5.33-5.55	6.00-6.10	9.67	9.92	11.11	11.36
Houston	6.70-6.95	....	7.30	6.70	....	6.70	6.70	6.40-6.70	7.69	10.45	10.40	11.45	11.75
Indianapolis	5.29	6.13	7.44	5.29	7.38	5.54	5.34	5.34	6.14	11.25	11.39	....	....
Kansas City	5.80	6.40	7.50	5.80	6.95	5.75	5.55	5.55	6.10	9.55	9.85	10.90	11.20
Los Angeles	5.45 ¹⁷	7.00	7.40 ¹⁷	5.95 ¹⁷	7.35 ¹⁷	5.50 ¹⁷	6.45 ¹⁷	6.60 ¹⁷	7.25	9.55 ¹⁷	9.75 ¹⁷	10.95 ¹⁷	11.35 ¹⁷
Memphis	5.75-5.80	6.60	7.20	5.80-5.95	6.80	5.95-6.00	5.75	5.75	6.53	....	....	....	....
Milwaukee	5.03	5.93	7.02	5.03-5.38	6.32	5.28	5.08	5.08	5.63	9.08	9.38	10.43	10.73
New Orleans*	5.95	6.75	....	6.15	....	6.15	5.95	5.95	6.65	....	....	....	....
New York	5.40	6.31	6.65-6.90	5.62	6.76	5.65	5.33	5.57	6.31	9.28	9.58	10.63	10.93
Norfolk	6.00	....	....	6.20	....	6.05	6.05	6.05	7.05	....	....	....	....
Omaha	6.13	....	6.33	6.13	....	6.38	6.18	6.18	6.98	....	....	....	....
Philadelphia	4.95	6.24 ¹³	6.63	5.40	6.29	5.35	5.10	5.40	5.98	9.05	9.35	10.62	10.87
Pittsburgh	4.85	5.75	6.90	5.00	6.00	5.05	4.90	4.90	5.40	8.90	9.20	10.25	10.55
Portland	6.50 ⁴ -7.05	8.00	8.80-9.10	6.85 ⁴	....	6.30 ⁴	6.35 ⁴	6.35 ⁴	8.25 ⁴	10.50 ⁴	10.10 ⁴	....	....
Salt Lake City	7.05	7.05	8.65	7.45 ⁵	....	5.65 ⁵	5.50 ⁵	7.10 ⁵	8.15	....	....	....	....
San Francisco	6.15 ⁴	7.50 ⁴	7.80	6.75 ⁴	8.25 ⁴	6.35 ⁴	5.90 ⁴	5.90 ⁴	7.55	9.80	10.00	11.20	11.60
Seattle	6.70 ⁴ -7.10	8.15 ⁴ -8.65	8.80-9.30	6.70 ⁴	....	6.35 ⁴	6.30 ⁴	6.20 ⁴	8.15 ⁴	....	10.35 ⁴	....	13.10 ⁴
St. Louis	5.22-5.37	6.12-6.27	7.32	5.22	6.65-7.54	5.47	5.27	5.27	5.82	9.27-9.72	9.57-9.97	10.62-11.17	10.92-11.42
St. Paul	5.44	6.19-6.34	7.54-7.64	5.44	6.82	5.64-6.69	5.49	5.49	6.04	9.49	9.79	10.84	11.14

BASE QUANTITIES Standard unless otherwise keyed on prices.

Hot-Rolled:

Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

Cold-Rolled:

Sheets, 400 to 1499 lb strip, extras on all quantities. Bars 1000 lb and over.

Alloy Bars:

1000 to 1999 lb.

Galvanized Sheets:

450 to 1499 lb.

Exceptions:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 499 lb; (4) 300 to 999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 lb; 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 399 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb; (18) 1000 to 1499 lb; (19) 1500 to 3499 lb; (20) 6000 lb and over; (21) 2000 to 3999 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....	Boston	Everett	\$0.50 Arb.	.....	50.50	51.00	.....	.....
Birmingham	38.88	39.38	.....	.....	.....	Boston	Steelton	6.90	.....	.....	.....	.....	50.90
Buffalo	46.00	46.50	47.00	.....	.....	Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Chicago	46.00	46.50	46.50	47.00	.....	Cincinnati	Birmingham	6.70	45.68	46.08	.....	.....	.....
Cleveland	46.00	46.50	46.50	47.00	51.00	Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Duluth	46.00	46.50	46.50	47.00	.....	Los Angeles	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Erie	46.00	46.50	46.50	47.00	.....	Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Everett	.....	50.50	51.00	.....	.....	Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Granite City	47.90	48.40	48.90	.....	.....	Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Ironton, Utah	46.00	46.50	.....	.....	.....	Philadelphia	Steelton	3.09	.....	.....	.....	.....	57.09
Pittsburgh	46.00	46.50	46.50	47.00	.....	Rochester	Buffalo	2.63	46.63	49.13	49.63	.....	.....
Geneva, Utah	46.00	46.50	.....	.....	.....	San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....	Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Steelton	46.00	46.50	49.00	49.50	54.00	St. Louis	Granite City	0.75 Arb.	46.65	49.15	49.65	.....	.....
Struthers, Ohio	46.00	46.50	46.50	47.00	.....	Syracuse	Buffalo	3.55	49.55	50.05	50.55	.....	.....
Swedeland	46.00	46.50	49.00	49.50	.....							
Toledo	46.00	46.50	46.50	47.00	.....							
Troy, N. Y.	46.00	46.50	49.00	.....	54.00								
Youngstown	46.00	46.50	46.50	47.00	.....							

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 35c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese

content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$50.50; f.o.b. Buffalo, \$60.75. Add \$1.00 per ton for each additional 0.50 pct Si up to 17 pct.

Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferro-silicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$68.50. High phosphorus charcoal pig iron is not being produced.

FERROALLOYS

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.	
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$172
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etam, Clairton, Pa.	\$176
\$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn 19-21% Mn	
3% max. Si 2% max. Si	
Palmerton, Pa.	\$64.00 \$65.00
Ph. or Chicago	\$5.00 \$6.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	\$5.5
Ton lots	\$7.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn	25.25 27.10 28.30
0.10% max. C	24.75 26.60 27.80
0.15% max. C	24.25 26.10 27.30
0.30% max. C	23.75 25.60 26.80
0.50% max. C	23.25 25.10 26.30
0.75% max. C	
1.00% max. Si	20.25 22.10 23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 11-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$73.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 1%. Add \$1.00 for each 0.50% Mn over 1%.	
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Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
4% Si, 2% Fe	20.70
7% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.20
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
5% Si	17.00
10% Si	11.30
15% Si	13.50
20% Si	14.65
30-35% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings Distilled
Ton lots	\$2.05	\$2.95 \$3.75
Less ton lots	2.40	3.30 4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered.	
(65-72% Cr, 2% max. Si)	
0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35
Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.	
Carload bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots.	
97% min. Cr, 1% max. Fe.	
0.20% max. C	\$1.09
0.50% max. C	1.05
9.00% min. C	1.04

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.	
30-33% Ca, 60-65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CM5Z

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50-56% Cr, 4-6% Mn, 13-50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis.	
V-5: 33-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

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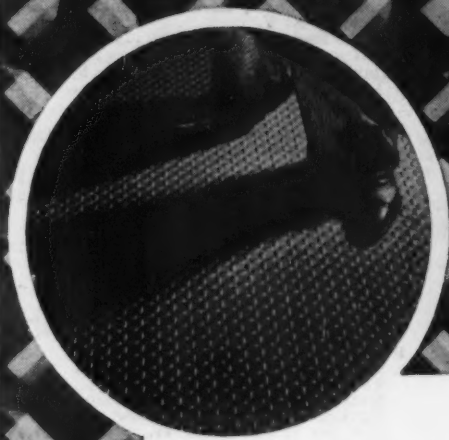
Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis.	
Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

5M2

Contract price, cents per pound of alloy, delivered.	
60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.40¢
Ton lots	8.80¢
Calcium molybdate, 45-50%, f.o.b. Langeloth, Pa., per pound contained Mo.	9¢
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	\$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.10
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Sigio, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti.	\$1.23
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti.	\$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads per net ton	\$160.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	\$2.35
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdenum oxide briquets, f.o.b. Langeloth, Pa.; bags, f.o.b. Wash., Pa., per lb contained Mo.	95¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Ton lots, packed, lump	11.75¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 98-92% V ₂ O ₅ , contract basis, per pound contained V ₂ O ₅	\$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	\$1.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢
Boron Agents	
Contract prices, per lb of alloy, del.	
Borasil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B.	\$4.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	3.625¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	\$1.20
F.o.b. Wash., Pa.; 100 lb and over	
10 to 14% B.	.75
14 to 19% B.	1.20
19% min. B.	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese-Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	\$1.67
Less ton lots	1.79
Nickel-Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silicaz, contract basis, delivered	
Ton lots	45.00¢



U·S·S MULTIGRIP FLOOR PLATE

Safe . . . Wet or Dry!

• U·S·S Multigrip Floor Plate offers sure footing and positive traction in every direction. Men work in safety . . . vehicles roll straight and true. There are no gutters to catch a narrow-wheeled vehicle . . . wheels roll *on* the risers not *between* them.

The flat-topped risers are evenly distributed to give full support to the foot. They're comfortable to walk on, safe to work on. And Multigrip is permanent. First cost is last cost.

For a safe, durable, economical flooring for your factory or for the equipment you make, use U·S·S Multigrip Floor Plate. Get further information about Multigrip from your nearest steel warehouse or write to us direct.

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Tennessee Coal, Iron & Railroad Company, Birmingham,
Southern Distributors

United States Steel Export Company, New York



UNITED STATES STEEL

Iron Age *Introduces*

Continued from Page 23



STUART SMITH, product manager, Reynolds Metals Co.

Stuart Smith has been appointed product manager of sheet and plate sales for REYNOLDS METALS CO., Louisville. Mr. Smith's most recent assignment from Reynolds Metals was manager aircraft sales at Dayton, Ohio. Prior to that he served as division manager of the New York office of Reynolds Aluminum Mill Products Div.

Raymond C. Randall has been named vice-president for operations and maintenance of the ERIE RAILROAD CO., Cleveland, succeeding Harold D. Barber, who has been granted a leave of absence. Mr. Randall joined the Erie R.R. in 1906 and has held various positions with the company. Milton G. McInnes, formerly eastern district general manager at Jersey City, has been made assistant vice-president reporting to Mr. Randall. Garret C. White will replace Mr. McInnes as general manager. Elmer J. Stubbs has been named general superintendent of transportation and H. Hale Clark has been elected superintendent of transportation.

James F. Clark has been elected treasurer of SHIPPERS' CAR LINE CORP., a subsidiary of American Car and Foundry Co., New York. Mr. Clark succeeds J. F. Varcoe, who has retired after 33 years' service.

A
CHECKERBOARD
OF PRODUCTS
PROTECTED BY
Udylite
Automatic
Plating



**PRODUCTION IMPROVED --
REJECTS CUT IN HALF!**

In the development of the famous U. S. Rubber "Brass-O-Matic" process for a permanent bond between rubber and metal, high quality plating was of primary importance. U. S. Rubber engineers turned to Udylite with their problem, with results that have paid off handsomely. Their Ft. Wayne plant has a top notch performance record to report. They say:

1. "Cost of materials per-unit-plated is about the same, BUT --
2. "The percentage of plated parts requiring re-processing has been cut in half!
3. "The new layout using Udylite equipment has reduced direct labor by 27%;
4. "Overall floor space requirements in the Plating Department have been greatly reduced, providing necessary space for storage of plating chemicals and supplies; and . . .
5. "Maintenance time required to keep units in good operating condition has been reduced substantially."

Every day, more and more shrewd production men are turning to Fully Automatic Plating Equipment—designed, installed and applied by The Udylite Corporation. Perhaps you have a plating problem in your plant! If you have, we will be glad to make recommendations entirely without cost or obligation. See your local Udylite representative or write today.



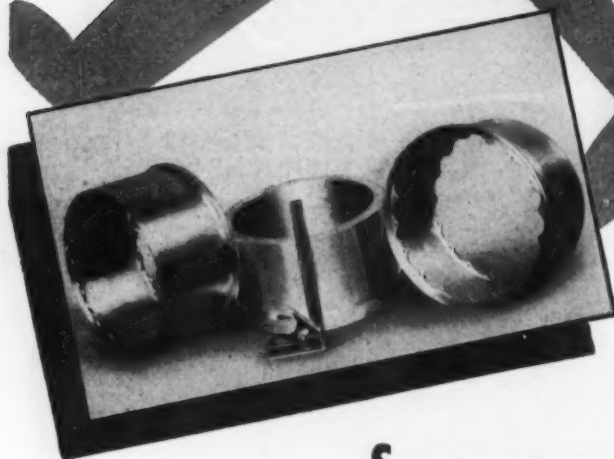
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U. S. RUBBER CO.,
FORT WAYNE PLANT

THE
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CORPORATION
DETROIT 11, MICHIGAN



Castings

FOR THE
JET ENGINE!



Special high alloy, of course...to meet the exceptionally high temperatures encountered in jet engine operation.

Centrifugally cast...to provide the dense grain, uniform, clean castings required by the strict specifications.

Duraloy...because of the consistent excellence of castings turned out in our modern, technically controlled foundry. And note the machining! The center casting is a rough blank, the right and left castings are finished.

Why not let our metallurgists and foundrymen take care of your high alloy casting requirements, too?

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IRON AGE INTRODUCES

Continued

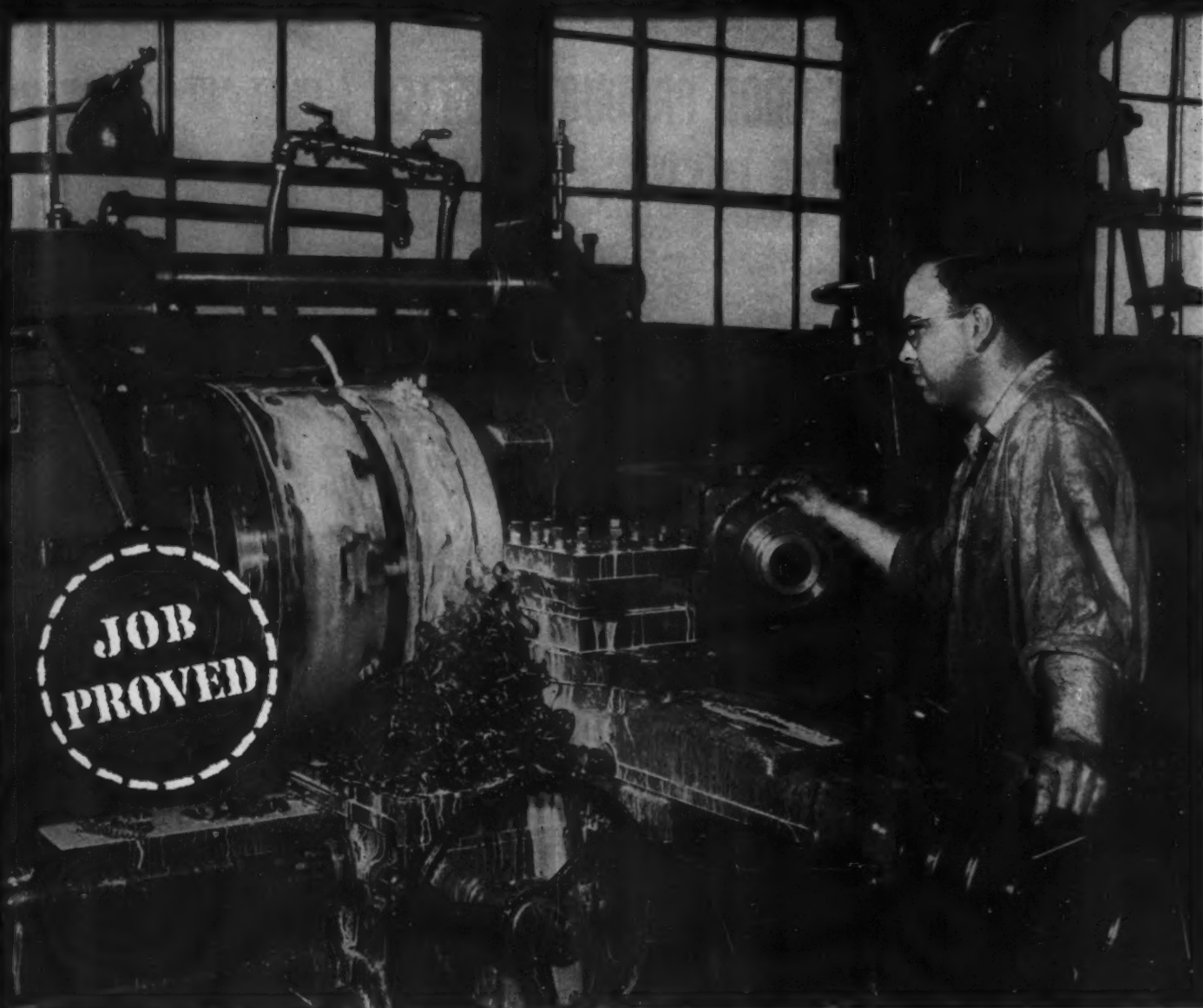


W. R. CAPLE, coordinator of branch office activities, Dow Chemical Co.

W. R. Caple has been appointed coordinator of branch office activities for the magnesium sales department of the DOW CHEMICAL CO., Midland, Mich. Mr. Caple joined the company as a metallurgist in 1931, and in 1935 became a member of the magnesium sales force. He has been in charge of magnesium sales in the Chicago branch office since 1939.

Robert D. Hill has been elected treasurer of the TAYLOR-WHARTON IRON & STEEL CO., Cincinnati, and J. G. Kreis appointed vice-president, purchases. Mr. Hill was formerly with Noma Electric Corp., New York, and the Union Switch and Signal Co., Swissvale, Pa. Mr. Kreis has been with the Weir Kilby Corp., Cincinnati, for 35 years, and his new appointment is in addition to his responsibilities as purchasing agent of the Weir Kilby Corp.

George M. Tisdale, vice-president of United States Rubber Co., Detroit, and Thomas R. Walker, vice-president of WARREN FOUNDRY & PIPE CORP., Boston, have been elected members of the board of directors of Warren Foundry & Pipe Corp. Mr. Tisdale joined the purchasing department of U. S. Rubber in 1920 and has held various positions for the company. Mr. Walker joined his company in 1931 and was elected vice-president in 1947.



S.E.C.O. BEATS COSTLIER CUTTING OIL

Competitive Product Fails to Match Fine Record of Sunoco Emulsifying Cutting Oil in Cost or Performance

For 27 years a metalworking shop used Sunoco Emulsifying Cutting Oil with complete satisfaction on difficult operations. The following is a typical example:

Machine: Gisholt turret lathe, model 4L.

Part: 20" press mold shell 22 1/4" O.D. x 6" wide x 20 1/2" I.D.

Operation: Turning, boring rough forgings.

Materials: 40-50 carbon steel.

Tools: Firthite carbide tools.

Feeds: .012 at 31 rpm.

Cuts: 1/4" to 3/4" on O.D. and boring.

Tool life was excellent. Machines stayed clean. High production, with minimum scrap, was the rule year in and year out.

Two years ago the shop was persuaded to try a competitive oil on the above operation. Test results showed that the competitive oil, costing three times as much, lacked stability. Performance was far inferior to that of Sunoco Emulsifying Cutting Oil in regard to tool life and quality of finish. The company

was quickly convinced that its original choice had been sound.

In all machine shop operations, on both ferrous and nonferrous metals, you'll find Sunoco Emulsifying Cutting Oil and Sunicut* straight cutting oils of real assistance. They help maintain production schedules, lengthen tool life, and keep operating costs down. For a free Sun cutting oil recommendation card, write Dept. IA-12.

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SUN OIL COMPANY - Philadelphia 3, Pa.

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SUN PETROLEUM PRODUCTS

"JOB PROVED" IN EVERY INDUSTRY

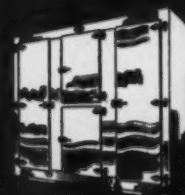
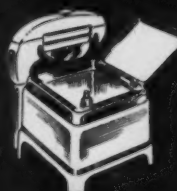


HOW TO MAKE GOOD PRODUCTS BETTER AT NO EXTRA COST...



with **PERMACLAD**
STAINLESS CLAD STEEL

Truly corrosion resistant!
Easily formed or deep drawn!



The Finer
The Finish The
Finer The Product
For The Finest Finish
Use
PERMACLAD

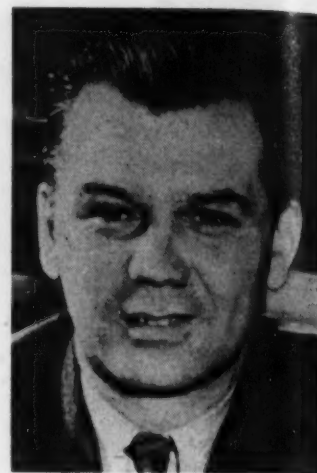
PERMACLAD
STAINLESS CLAD STEEL

A Product of **ALAN WOOD STEEL COMPANY**

OTHER PRODUCTS

IRON AGE INTRODUCES

Continued



ERIC DUDLEY, manager of aviation development and manager of Pacific Coast Dist., Tinnerman Products, Inc.

Eric Dudley has been appointed manager of aviation development and manager of the Pacific Coast Dist. of **TINNERMAN PRODUCTS, INC.**, Cleveland. Mr. Dudley has served since 1946 as a sales engineer in the Tinnerman Detroit office, and prior to joining the organization was production manager of the Boots Aircraft Nut Corp., Stamford, Conn.

Joseph B. Dietz has been appointed manager of the industrial sales section of the Finishes Div. of the **DUPONT CO.**, Wilmington, Del., succeeding **Henry E. Lackey**, who is retiring after 45 years with the company. Mr. Dietz has been assistant industrial sales manager since 1945. Mr. Lackey joined Du Pont in 1907 and has held various positions with the company since that time. **William P. Fisher, Jr.**, comes to Wilmington as assistant manager of industrial sales, he was formerly industrial sales manager in the Chicago region.

William J. Niles has risen to sales manager of **MONTREAL LOCOMOTIVE WORKS, LTD.**, Montreal. Mr. Niles has had sales and production experience with the company for 32 years. **Ira I. Sylvester** has been appointed technical sales engineer of the diesel division. Mr. Sylvester was formerly transportation specialist for the Canadian General Electric Co. **J. S. O. Neville** has been placed in charge of the diesel-electric sales and service division. For the past three years Mr. Neville has specialized in diesel electrics for the company.

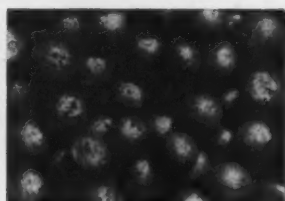
THE IRON AGE

TRU-STEEL SHOT LASTS LONGER

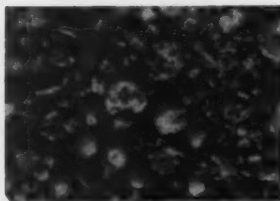
COMPARISON -- TRU-STEEL vs. CHILLED IRON SHOT

Showing relative break-down after a given number of passes through a centrifugal blasting wheel.

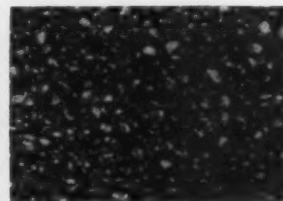
CHILLED IRON
230 at Mag. 10X



NEW SHOT

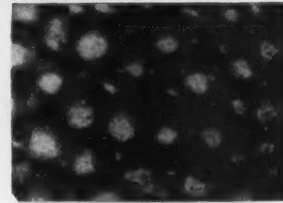
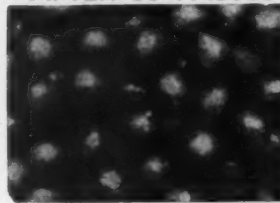
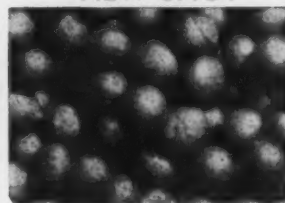


AFTER 50 PASSES



AFTER 1500 PASSES

TRU-STEEL
230 at Mag. 10X



SAVES \$1.09 per Wheel Hour for an Ohio Tool Manufacturer*

By replacing Chilled Iron Shot with TRU-STEEL this customer saved 62% on the cost of shot and machine parts, as shown in the chart below. Like many other manufacturers, they found that TRU-STEEL Shot lasts many times longer than chilled iron because it wears down slowly without breaking down.

TRU-STEEL Shot is perfectly formed of electric induction furnace steel that has received a full

heat treatment—not just a draw or anneal. It is round and solid, hard and tough, accurately graded and controlled as to quality and hardness.

By using TRU-STEEL you will find that wearable parts last longer, less machine maintenance is required, there is less abrasive to ship and store, and cleaning costs per ton are much lower. A test will show you how much you can save. Write today for descriptive Bulletin No. 59.

*Name on request

PERFORMANCE CHARACTERISTICS

1. Cleans as fast—or faster—than chilled iron shot.
2. Reduces machine maintenance costs.
3. Increases life of machine parts.
4. Lasts many times longer than chilled iron shot.
5. Saves storage space and transportation costs.
6. Reduces cleaning costs per ton.

COST COMPARISON CHART

TYPE OF SHOT	CHILLED IRON	TRU-STEEL
Shot Used in 80 Wheel Hours	1950 Lbs. (24.4 lbs. per Wheel Hour)	400 lbs. (5 lbs. per Wheel Hour)
Cost of Shot	\$ 87.00	\$45.00
Cost of Parts	\$ 52.65	\$ 6.80
Total Cost	\$139.65	\$51.80

SAVINGS

(80 Wheel hours) \$87.85

DISTRIBUTED BY



American
WHEELABRATOR & EQUIPMENT CORP.

510 S. Byrkit St., Mishawaka 3, Indiana

Mfd. by: Steel Shot Producers, Inc., Butler, Pa.



"Quick, Plunkett...the NET!"

Yes, indeed! When profits show signs of taking flight, it pays to look to the net—NET sales and NET costs.

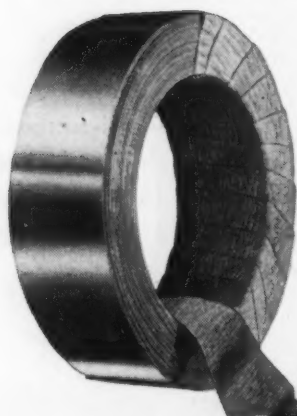
* * *

Pre-coated Thomas Strip is a direct route to cost reduction—a short-cut to economical production, because it eliminates several costly production steps that consume time, labor and valuable floor space.

Take COPPER-COATED Thomas Strip, for example:

Its uniform pre-coat of copper on steel helps streamline your production to two essentials—fabrication and assembly. Little cleaning or buffing is needed. The non-peeling, non-cracking copper coating is unharmed in fabrication; it protects parts in process against corrosion, and serves either as the final product finish or as a ready base for further plating. It lubricates dies, increases die life and cuts retooling costs.

Looking to your NET? It will pay you to test pre-coated Thomas Strip in your plant and processes. Write us for more information, for samples and for metallurgical assistance—without obligation.



THE THOMAS STEEL COMPANY
WARREN, OHIO

Specialists in Cold Rolled Strip Steel



Electrocoated with Chromium, Nickel, Copper, Zinc and Brass • Hot Dipped Tin and Lead Alloy • Lacquer Coated in Colors • Annealed and Tempered Spring Steel • Alloy Strip Steel • Uncoated Strip Steel • Produced to Your Specifications.

Thomas Strip

SPEEDS PRODUCTION...CUTS COSTS

IRON AGE INTRODUCES

Continued



EDWARD H. ROOS, factory manager, C. A. Norgren Co.

Edward H. Roos has been appointed factory manager of the C. A. NORGREN CO., Denver. Mr. Roos has been associated with Wilson-Snyder Mfg. Corp. and more recently has served as works manager of the Imperial Div. of Oilwell Supply Co., Oil City, Pa.

A. B. Cameron and J. T. Ryan, Jr., have been appointed directors of RUUD MFG. CO., Pittsburgh. Mr. Cameron is a vice-president and general manager of the company, and Mr. Ryan is executive vice-president of Mine Safety Appliances Co., Pittsburgh, and a director of Thomas A. Edison, Inc., West Orange, N. J., Thorofare Markets, Inc., and Townsend Co., New Brighton, Pa.



A. B. CAMERON, director, Ruud Manufacturing Co.



"Popcorn and Push-Ons"

... a story of product redesign using 4 Push-On Type SPEED NUTS to eliminate 14 operations ... cut material costs 30%!

How to keep the "lid" on the retail price of their new, distinctive popcorn popper was a problem faced by Popex, Inc., Cincinnati, Ohio.

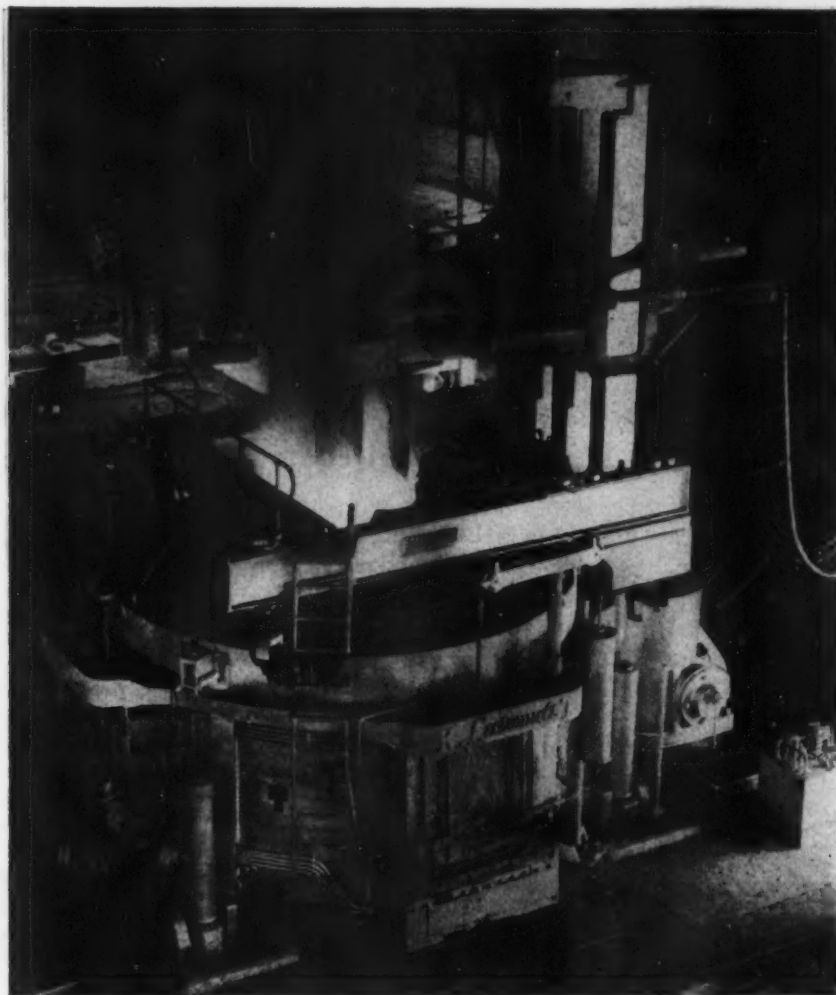
This meant watching production costs carefully. For instance, the cost of attaching the metal legs to the base seemed out of line. Alternate methods were considered, and Push-On Type SPEED NUTS combined with plastic legs provided the best, fastest and most economical solution. This combination eliminated 14 assembly operations and reduced material costs 30%!

From popcorn poppers to passenger cars, SPEED NUT brand fasteners are proving their value—in faster, easier assembly, lower costs and better product design. A Tinnerman Fastening Expert can show you how to gain these benefits. Contact him by phone. Also, write for your copy of SPEED NUT Savings Stories—actual case histories of cost savings. TINNERMAN PRODUCTS, INC., 2040 Fulton Road, Cleveland 13, Ohio. In Canada: Dominion Fasteners, Ltd., Hamilton.

BEFORE: The original Popex design called for use of metal legs, blanked, formed and plated. Also required plastic bumper buttons attached with rivet and washer. Two rivets attached each leg to base plate.

AFTER: Plastic legs having integral studs are inserted through punched holes in side of base plate. Push-On SPEED NUTS are zipped over studs with hand tool. SPEED NUT prongs "bite" into plastic, holding leg securely.

TINNERMAN *Speed Nuts*



FIFTY-FIVE TON heats are regularly poured by this Size KT Moore Rapid Lectromelt Furnace. With a KVA rating of 15,000 and a shell diameter of 17'0", this big Lectromelt is ideal for heavy production jobs. It possesses all the famous features which put Lectromelt ahead of the metal melting field: topcharging, patented counterbalanced electrode control system, low electrode consumption and rugged overall durability.

Lectromelt Furnaces are available in sizes ranging from 100 tons to 250 pounds. Write today for the Lectromelt catalog for detailed information.

PITTSBURGH LECTROMELT FURNACE CORP.

PITTSBURGH 30, PA.

manufactured in: CANADA, Lectromelt Furnaces of Canada, Ltd., Toronto 2; ENGLAND, Birlec, Ltd., Birmingham; SWEDEN, Birlec Elektkougner A/B, Stockholm; AUSTRALIA, Birlec Ltd., Sydney; FRANCE, Stein et Roubaix, Paris; BELGIUM, S. A. Belge Stein et Roubaix, Bressoux-Liege; SPAIN, General Electrica Española, Bilbao; ITALY, Forni Stein, Genoa.



IRON AGE INTRODUCES

Continued



A. A. JOHNSON, manager, Central Station Engineering, Westinghouse Electric Corp.

A. A. Johnson has been appointed manager of Central Station Engineering in the industry engineering department of the WESTINGHOUSE ELECTRIC CORP., Pittsburgh, succeeding Dr. Charles F. Wagner, who has recently been made consulting engineer for the company. Mr. Johnson came to Westinghouse in 1941. Since then he has handled consulting engineering problems. Mr. Wagner is now in his 31st year with the company and for the past eight years was manager of Central Station Engineering. J. O. Clevenger has been named manager of the welding department and J. P. Coughlin has been named manager of field sales of the welding department. Prior to his new appointment Mr. Clevenger was manager of agency and specialty sales for the southeastern district and Mr. Coughlin was manager of welding products, agency and specialty sales department.

E. E. Ames has been named chairman of the board of the GENERAL BOX CO., Chicago. Mr. Ames has aided in the foundation of the company in 1922 and, prior to his retirement in 1947, served as vice-president and director of sales. W. C. Embry, vice-president in charge of the Louisville plant, has been elected director to fill the position occupied by his father, the late Harry W. Embry. J. F. Ferguson, vice-president and sales manager, has been advanced to director. Both Mr. Embry and Mr. Ferguson will retain their old duties.

The **STANDARD** *Axial Flow* **BLOWER**

Makes RPM=CFM . . . a performance typical of our No. 5

positive displacement blower—suitable for capacities of 800 to 2200 CFM at speeds of 800 to 2200 RPM operating at differential pressures of 2 to 20 p.s.i. The Standardaire No. 5 Blower offers this flexibility of operation plus the desirable characteristics of extremely low noise level and high efficiencies. To insure long service life under continuous operation these features have been built into the modern design Standardaire Blower: accurately generated, screw type rotors . . . shaved helical gears . . . precision, oversize, anti-friction bearings . . . oil pump with filter and strainer . . . three-point mounting. For further details write the Standard Stoker Company, Inc., Dept. A-18, 370 Lexington Ave. New York 17, N. Y.

A UNIQUE PULLEY ATTACHMENT . . .

The Standardaire No. 5 Blower will deliver a cubic foot of absolutely clean air for each revolution of its main rotor. Although direct drive from a motor ordinarily meets requirements, at such times when direct drive cannot be used a novel type pulley may be applied and a wide range of speeds gained. Each speed will give a definite air output to meet exacting demands. Contrary to the usual practice, the pulley is not mounted directly on the blower shaft. It is carried on an extra, built-in bearing which, in turn, is supported within a hollow bracket flange mounted on the blower. The pulley is driven through an internal gear type coupling—its bearing receives positive lubrication automatically from the main oiling system. This modern design drive pulley eliminates all cumbersome outboard bearings and jackshafts — another feature contributing to the remarkable flexibility of the Standardaire Positive Displacement Blower.



THE STANDARD STOKER CO. INC.

A PRODUCT OF

Standard Stoker



NEW YORK • CHICAGO • ERIE • MONTREAL

Is your plant making full use of ELECTRIC HEAT?

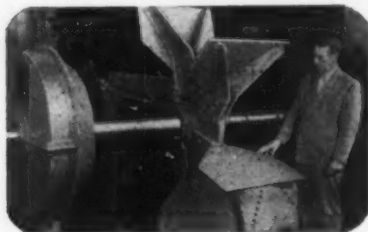
See this film and find out!



1. "HEAT... WHERE YOU WANT IT" is the name of a new General Electric sound slide-film on industrial electric heaters. It covers dozens of cost-cutting opportunities for electric heat, as in the crank-case cleaner (above) where...



2... a built-in immersion heater was used to supply the hot oil needed to do the job right. Another place where electric heat had to make oil "keep moving" was in the feed lines of this fuel-storage tank (above). But the big opportunity for electric heat is in...



3... heating surfaces which, in turn, heat something else. Typical of the applications shown in the film is this sludge-drying fan (above) where electric heaters are clamped between the blade sections. A simple application, yet completely effective!



4. If you want to dry, bake, cure, warm, or ripen something, there's plenty of visual data on air heating, too. You can even see how it's done "on the run" as in this continuous air-heating tunnel (above). Or, possibly you'd like to...



5... melt a soft metal—and keep it melted, the way it's done in this automatic can-soldering machine (above). "Heat... Where You Want It" has all the facts you need. To convince you of its worthwhileness, we'd like to send you these 5 helpful...



6. APPLICATION BULLETINS—FREE! Fifty copies of each come with a complete film kit (35mm slidefilm, 33 1/3 RPM record, bulletins—cost, only \$15). Once you've seen them, you'll want to see—and buy the complete program. MAIL THE COUPON TODAY!

FREE
to business
management!

General Electric Co., Section C684-18
Schenectady 5, N. Y.

Attach to your business letterhead

- ☐ Please send me a complimentary set of your Electric Heater Application Bulletins (GEA-5077, GEA-5095, GEA-5096, GEA-5097, GEA-5098).
- ☐ I'd like to borrow the sound slidefilm from my nearest G-E office.

Name _____ Title _____

Company _____

Street _____

City _____ State _____

GENERAL  ELECTRIC

IRON AGE INTRODUCES

Continued

Sherman M. Goble has been named manager of the new Plating and Electrochemical Dept. of Federated Metals Div., AMERICAN SMELTING AND REFINING CO., New York. Prior to his association with the company Mr. Goble was with Seymour Mfg. Co., Seymour, Conn., McGean Chemical Co., Cleveland, and the Lea Mfg. Co., Waterbury, Conn.

OBITUARIES

Fred W. Beyer, general superintendent of Indianapolis Drop Forging Co., Indianapolis, died recently.

Ben Sloan, 66, Newark, N. J., representative Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford, Conn., died Nov. 17.

Jesse E. Dowley, 65, president and general manager of the Cal-Van Machine Products Inc., Jackson, Mich., died Nov. 9.

Francis James Hook, 44, president of Ansul Chemical Co., Marinette, Wis., died Nov. 10.

William J. Sullivan, 75, city engineer of Somerville, Mass., died Nov. 17.

Resume Your Reading on Page 24

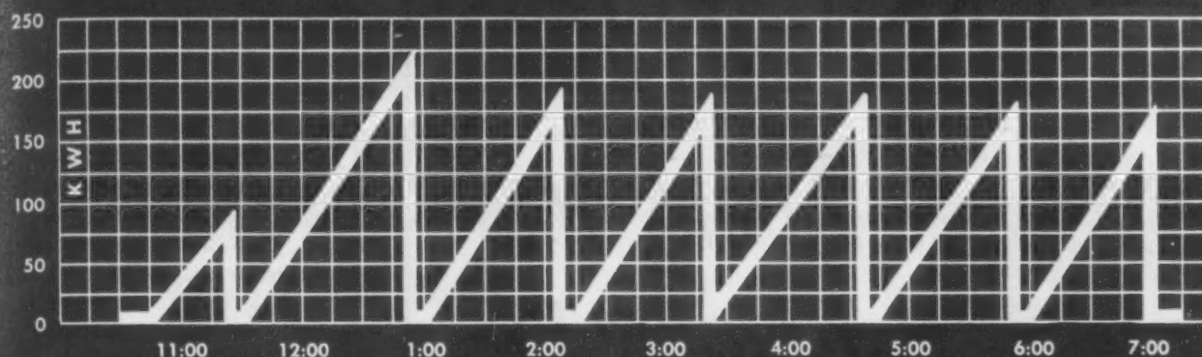
Venezuelan Power Project Receives Export-Import Bank Credit

Washington — The Export-Import Bank will provide half the credit needed for American equipment necessary for a 5-year power expansion project in Venezuela.

Electricidad, a Venezuelan corporation, expects to spend more than \$14 million for construction, about \$10.4 million of which will be spent with the International General Electric Co. for generating and distribution equipment and services.

Half the equipment cost will be financed by IGE through its own facilities. The Export-Import Bank will establish a credit for the remainder, to be paid in 10 installments over the 5-year period. Repayment is guaranteed by the Venezuelan government.

DETROIT **ROCKING** ELECTRIC FURNACE



One month's operation of type LFY, 175 KW, 700 lb. nominal cold charge capacity Detroit Rocking Electric Furnace. High strength, alloy automotive irons poured at 2800-3000° F.

- No. heats per day—7 • Av. heat weight—1000 lbs. • Total lbs. cold melted—168,930 • Av. power consumption, including preheat—549 KWH/ton • Av. power cost @ 1¼¢/KWH—\$6.86
- Av. electrode consumption—4.15 lbs./ton • Av. Electrode cost @ 22¢/lb.—\$.913/ton • Av. no. heats/lining—253 (9-month average) • Av. refractory cost—\$3.64/ton.

NOTE: Operator handles two such furnaces all day. Furnaces are equipped with automatic electrode control as well as automatic rocking control.

FASTER, CHEAPER, BETTER MELTS IN SINGLE or MULTIPLE OPERATION



Detroit Rocking Electric Furnaces achieve increased production at reduced costs, with rigid control over quality.

The above operating graph of a type LFY, 175 KW, 700 lb. nominal cold charge capacity Detroit Rocking Electric Furnace melting high strength alloy automotive irons is typical of one day's eco-

nomical operation. Multiply this day's savings by the working days of the year and you realize the owner's great savings.

Besides optimum power use, all-electric operation precludes handling and storing messy, bulky fuels. Equally advantageous is the positive control of operational speed, composition quality and other melting factors. Out-of-production time due to burned-out linings is minimal. Spare, previously-lined furnace shells are quickly, easily installed.

Other saving features are fast, uniform outputs; lowest metal loss by shrinkage; conversion of shop borings and turnings with least loss from oxidation. The arc is automatically established clear of the

molten bath at all times. The metal is never a part of the electrical circuit, assuring uniform temperatures within the melting chamber.

Detroit Rocking Electric Furnaces are available in 10 to 4000 lb. capacities with either conical or cylindrical chambers. Individually designed to meet your plant electrical specifications.

Whether you melt ferrous or non-ferrous metals, send us your production data. Our engineers will furnish you facts on how you gain ultimate operating economy with positive melt-quality control, using the Detroit Rocking Electric Furnace suited to your requirements in size, capacity and use. Address:

DETROIT ELECTRIC FURNACE DIVISION

KUHLMAN ELECTRIC CO. • BAY CITY, MICHIGAN



FREE TO GEAR BUYERS




*everything that
Purchasing Ex-
ecutives, Design
and Production*

*Engineers would want to
know about a potential
source of supply for their
custom gear requirements
is covered in this new bul-*

letin on **PERKINS GEAR
ENGINEERING SERVICE**

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PERKINS MACHINE & GEAR COMPANY
West Springfield, Massachusetts
Springfield  7-4751

• News of Industry •

Lukens Output Bounces Back Quickly Following Steel Strike

Company profits from experience
gained during steel strike of '46.

Coatesville, Pa. — Commenting on Lukens Steel Co.'s speedy return to near-capacity output following the steel strike, L. M. Curtiss, general works manager, said, "We can attribute most of it to the fact that the openhearth were all virtually unharmed by idleness during the strike, largely because most were newly rebuilt. By following a well defined routine which was set up by J. E. Mateer, openhearth superintendent, during the strike, and taking precautions, only slight construction was necessary to replace a few displaced bricks and to restore part of a fallen ring on the roof of one of the furnaces. This masonry work was completed within 2 hr."

In the previous strike of 1946, three big openhearth masonry arches were lost in the slag pockets when operations were resumed. Remembering that experience, different preparations were made when the present strike was called on Oct. 1. This time, instead of keeping the openhearth fires lit, they were shut off completely, the dampers closed, and the water turned off.

Furnaces Heated Slowly

At midnight of Nov. 5, when the strike was ended, instead of starting the fires immediately when work was resumed, jet fires, fed by long pipes, were started in two furnaces, followed by others at 4-hr intervals. These jet fires, burning natural gas, took the chill off the furnaces, so that they could be lighted within 24 hr and the heat worked up gradually.

In addition to the jet fires in the openhearth furnaces, wood fires also were built on the large 70,000-lb bottom plates in the openhearth pits, and driers were placed in the ladles to take the chill out of them before they were subjected to molten steel at a temperature approximating 3000°F.

**WHEN YOU USE
AMERICAN
WELDING**

"Controlled Technique"

**YOUR PRODUCTS HAVE
THESE ADVANTAGES**

1. Insured Conformity to Specifications
2. Lower Cost
3. Closer Tolerances
4. Less Machining
5. Prompt Delivery

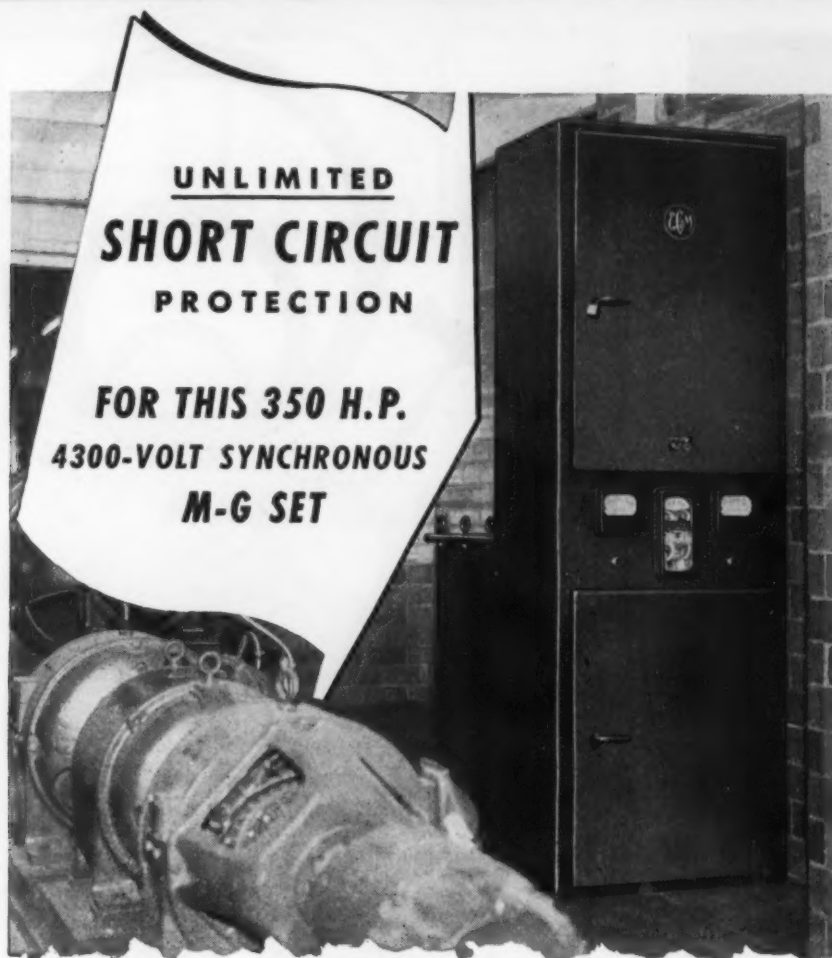
Before choosing any other method of fabrication, check with American Welding. If you use rings, bands, assemblies, weldments, or any other products that lend themselves to the welding process of manufacture, it will be to your advantage to specify fabrication by American Welding "Controlled Technique", developed from 32 years of welding experience. Skilled designers and engineers will adapt this experience to your requirements without obligation. We'll gladly talk about your problem at your convenience.



**PRODUCTS MANUFACTURED BY ALL
TYPES OF RESISTANCE AND
FUSION WELDING**

**THE AMERICAN WELDING &
MANUFACTURING CO. - WARREN, OHIO
120 DIETZ ROAD**





**UNLIMITED
SHORT CIRCUIT
PROTECTION**

**FOR THIS 350 H.P.
4300-VOLT SYNCHRONOUS
M-G SET**

with E C & M VALIMITOR (Volt-Ampere-Limiter) STARTER

There's no ceiling on VALIMITOR protection because fault currents are limited to a maximum of 25,000 KVA (steady state current) and the well-known Type ZHS Contactor used in these starters clears such faults quickly.

Because protection is unlimited—there's no need for calculating existing short circuit capability—no need to fear that these starters will be out-moded by future growth in KVA.

Also there are no fuses to replace after a fault. Protection is permanent, today and forever.

Write for COMPLETE FACTS—ASK FOR
No. 23 ACCELERATOR BULLETIN

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO

Dear Editor

PENSION PLANS

Would you please be kind enough to elaborate on the editorial "Who Pays For Pensions?" in the November 10 issue, which reads, "So the consumer may finally pay part of the new contracts being signed in steel and elsewhere."

This statement collides with my impression that the consumer ultimately pays all the cost, provides all the profits, for just as soon as the consumer stops buying, a business is through. Is it possible that this is not so? Or is it possible that people do not realize that no matter how involved a path a chunk of steel may follow before it finally ends up on the junk pile, its entire journey is paid for by no one but the consumer? If this is true, then labor is trying to lift itself by its bootstraps, by trying to get its pensions out of its own pockets by forcing an increase in the prices of the goods labor buys as consumer.

Duncannon, Pa.

ETHAN W. VARS

Costs are either (1) absorbed, (2) paid for by higher prices or (3) a combination of both. If they are absorbed it means executives, engineers and research men must find better tools, better machinery, better techniques and better products. If it is passed on in the forms of higher prices, the net gain is practically zero to the worker and the consumer. There is a limit as to how high prices can be pushed, so what really happens is No. 3. But, as you suggest, the man on the street finally foots the entire bill. And in the case of current private pension plans, it appears as though 50 million workers are going to pay part of the cost, at least for the private pensions which will go to less than 10 million.—Ed.

CONTOUR MACHINING

We note in the September 1 issue on p. 90 an article on an electronic contour machining system which has been developed by the General Electric Co., Ltd. We should be glad to learn whether you have further details of this with which you could oblige us, or the branch of the General Electric Co. to which we should apply.

C. H. BOOTH
Technical Advisor
Firth Brown Tools, Ltd.
Sheffield, England

Further information on the electronic contour machining system may be secured from Apparatus Div., General Electric Co., 1 River Rd., Schenectady 5, N. Y.—Ed.

Turn to Page 148

There's More than One Way to Bear Down on Costs

By James B. Scott, President
Welded Products Company, Grand Haven, Michigan

When the backfield runner hits the line and finds a stone wall, he tries to skirt around it for yardage. Likewise, many shops follow these tactics in the tussle for lower costs.

When we can make no further headway in cost reduction with an existing method, we often manage to find new, fresh approaches to the problem. For example:

1. Examine the design. To improve the cast sprocket for a chicken feeder, we used two stampings as shown in Fig. 1. The resultant sprocket operates better because the feed doesn't jam in the teeth. To get the same results with the former design would have cost considerably more.

2. Examine the set-up. We were nip and tuck with competition (another process) on a machine base. By devising an improved clamping and positioning fixture, we speeded up output from 5 bases to 9 bases per day—cut unit cost \$2.20 each.

3. Examine the welding procedure. Types and sizes of electrodes . . . amperage . . . A.C. or D.C. . . . these factors are weighed in setting up the procedure for each job. On a recent cold-rolled steel job, we used "Shield-Arc LH-70" electrodes and eliminated pin-holes, speeding up welding and cutting costs.

In all of our efforts to bear down on costs, we find it extremely helpful to have the advice of the Lincoln Welding Engineer, and we use Lincoln Welders and Electrodes practically 100%.



Fig. 1. Changeover of this chicken-feeder sprocket to welded stampings eliminated feed jamming.



Fig. 3. Typical of the welding output of Welded Products Company is this group of engine brackets, fabricated from stampings and shear-cut plate.

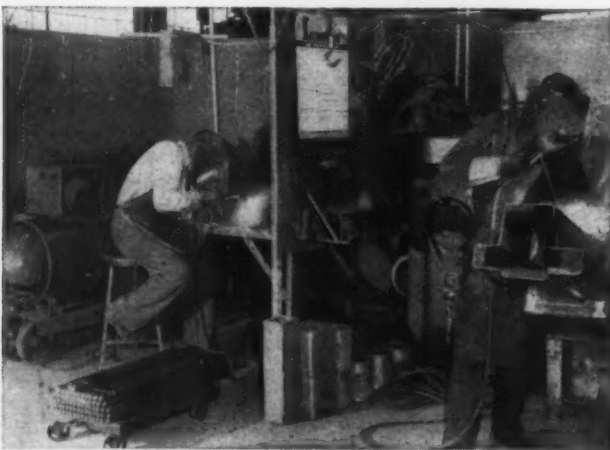
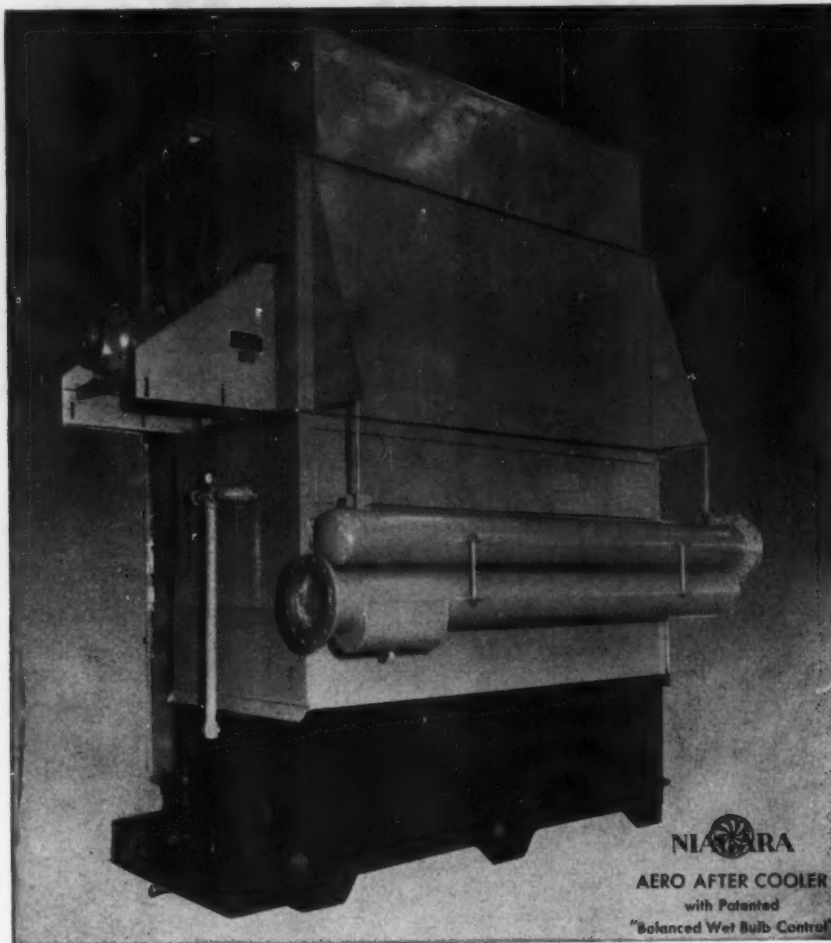


Fig. 2. Two points of attack on welding costs: Left—Duane Brady and James Scott work on the modification of a product design. Right—Ingenuity is applied to the design of fixtures and the planning of welding procedure for each product.

The above is published by **THE LINCOLN ELECTRIC COMPANY** in the interests of progress.
Write for free Mild Steel Weldirectory, Bul. 462. The Lincoln Electric Company, Dept. 513, Cleveland 1, Ohio.



How to PREVENT CONDENSATION in COMPRESSED AIR LINES

● Users of pneumatic tools and machinery spend thousands of dollars on repairs and suffer much interruption to production from the condensation of water in their air lines. In compressed gas systems and in processes where compressed air is blown directly on parts and materials in production, there is additional damage.

You can prevent these losses by installing a Niagara Aero After Cooler. It cools the compressed air or gas by evaporative cooling and removes the water before the air enters the receiver. This method brings the air to within a few degrees of the wet bulb temperature, making certain that your compressed air will always be colder than the atmosphere surrounding the lines in your plant, so that no further condensation can take place.

Savings in cooling water pay for the installation. Experience shows that the patented Niagara evaporative cooling method consumes less than 5% of the water required for cooling by conventional means. You save the cost of the water, the cost of pumping it, the cost of disposing of it. These extra savings soon pay for the Niagara Aero After Cooler.

Write for Bulletin No. 98

NIAGARA BLOWER COMPANY

Over 35 years of Service in Industrial Air Engineering

Dept. IA

405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities

INDUSTRIAL COOLING  HEATING • DRYING

NIAGARA

HUMIDIFYING • AIR ENGINEERING EQUIPMENT

DEAR EDITOR

Continued from Page 144

HARD STEEL

Please be good enough to tell us where we can obtain a list of manufacturers and distributors of hard steel such as Carboloy and Stellite.

A. A. Morse & Co.
New York

A list of manufacturers and distributors of tool, metal-cutting and die steels, and sintered carbides, including Carboloy and Stellite are included in the Directory of Tool Steels published by THE IRON AGE. In addition to the list of manufacturers and distributors, the directory contains charts showing comparative tool steel brands made by the different manufacturers and includes a dictionary of trade names in which the composition, use, and manufacture of each steel is included. These directories are \$2 each and in lots of six or more, \$1 each. —Ed.

COST REDUCTION COURSE

Holy Cross College Industrial Relations Institute is offering a course during the coming months on cost reduction in industry for supervisory personnel. This library has for several years conducted a library deposit at the college on the evenings of these courses. The professor in charge of the course has asked us to put on a display of a few outstanding magazines of business and industry, the special features of which he will point out to this group and give reference work using these as source material. However, this library immediately binds its periodicals and keeps same for reference use only. Would you please send us one or two of the recent issues of THE IRON AGE to be placed on display?

M. A. McGRATH
Technology Div.

Free Public Library
Worcester, Mass.

We certainly like to do anything within our power to encourage a greater familiarity with industry and are forwarding several copies of THE IRON AGE.—Ed.

STEEL SALES

As a graduate student at Northwestern University, I am working on a research project concerning the iron and steel industry. I would appreciate any information you could supply regarding sales in these industries for 1948 and 1949.

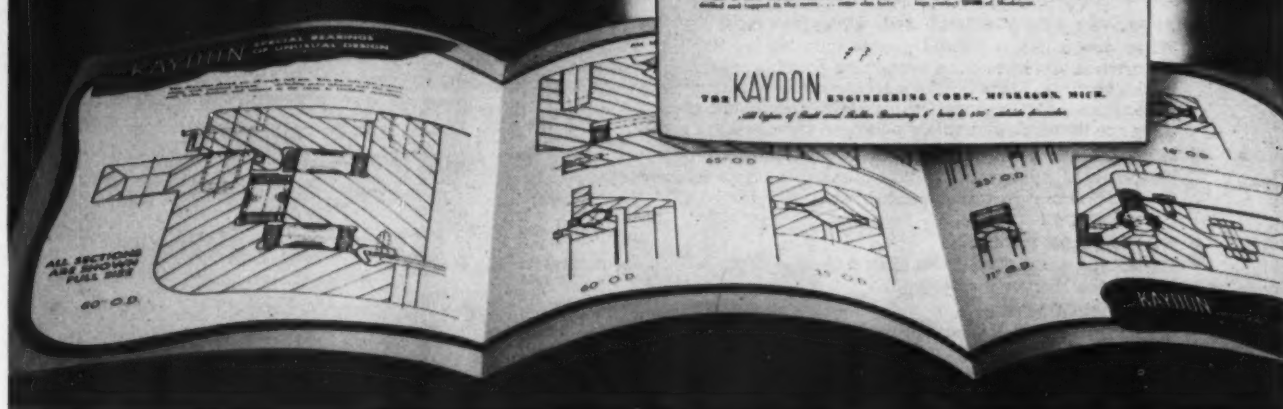
W. T. ALEXANDER
Evanston, Ill.

Information on iron and steel sales is compiled by the American Iron and Steel Institute, 350 Fifth Ave., New York 1. We also suggest that you consult files of the Library of the Northwestern Technological Institute for the first issue of THE IRON AGE published each year. This is a review issue, and contains a wide assortment of statistical and industry information which will save you considerable time in gathering your data.—Ed.

Resume Your Reading on Page 145

**THIS KAYDON BULLETIN
CONTAINS DATA ON
DEEP-FLAME-HARDENING
AS PIONEERED BY KAYDON**

Write for this Bulletin now!



**The KAYDON technique of deep-flame-hardening for
bearings of unusual shapes, sizes and thin sections**

Designers and users of special machinery will appreciate this information on KAYDON-pioneered deep-flame-hardening which has helped remove bearing-limitations that heretofore proved to be serious handicaps.

This new KAYDON technique in deep-flame-hardening hardens only the raceways of the bearings. This permits the races themselves to be accurately drilled, tapped and gear-cut . . . eliminates many of the surrounding parts which normally

would be necessary . . . results in important weight-reduction . . . makes possible the creation of unusual designs that accommodate minimum sizes of bearings in the space available . . . permits unusual shapes, very large diameters, and extremely thin sections, all of which greatly facilitate mounting.

Write for this Bulletin on KAYDON Deep-Flame-Hardening . . . and when you need the unique services offered, contact KAYDON of Muskegon.

THE KAYDON ENGINEERING CORP., MUSKEGON, MICH.

• ALL TYPES OF BALL AND ROLLER BEARINGS 4" BORE TO 120" OUTSIDE DIAMETER •

BINKS

Dynaprecipitor Water Wash SPRAY BOOTHS



NO OTHER SPRAY BOOTHS GIVE YOU ALL THESE ADVANTAGES

- 1 APPROVED PERFORMANCE AND CONSTRUCTION**
When you install a Binks Dynaprecipitor Spray Booth in your finishing department you have done everything possible to eliminate fire and health hazards. These booths meet the requirements of local and state authorities...are endorsed by insurance companies. They are the mark of a safely equipped shop.
- 2 EXHAUST AIR WASHED 5 TIMES**
The patented Dynaprecipitor principle draws fumes and over-spray through 5 unbroken water-curtains before it is vented... clean and dry.
- 3 NO NOZZLES TO CLOG**
The unique water distribution system in these booths eliminates nozzles... guarantees thorough washing.
- 4 FASTER PRODUCTION**
Stops drift...lets you place spray stations closer to each other. Minimizes clean-up time.
- 5 BETTER SHOP MORALE**
There is no paint smell. air in the shop remains fresh...and the shop stays cleaner.
- 6 RECLAMATION OF OVER-SPRAY**
All paint is washed out of the over-spray and trapped in the collecting pan where it can be easily reclaimed.
- 7 SIMPLIFIED CONSTRUCTION**
Dynaprecipitor booths are shop fabricated in standard sizes from 4 to 20 feet wide. Panels bolt together with gasketed joints, quickly and simply.
- 8 PRICED RIGHT**
This is equipment on which you do not pay a premium to get the best. Dynaprecipitor spray booths are unsurpassed...but you don't pay any more for them.
- 9 ECONOMICAL TO OPERATE**
The same water is recirculated. Only cost is operation of the circulation pump.

"We hope buyers will compare our Dynaprecipitor with other water wash booths. It's always very convincing!"

J. J. Roche
Chairman of the Board

Send for Bulletin 500

and see for yourself the many great advantages of these modern, well engineered spray booths. No obligation.



Binks

MANUFACTURING COMPANY

3116-34 West Carroll Ave., Chicago 12, Ill.

NEW YORK	DETROIT	LOS ANGELES	ATLANTA	BOSTON	CLEVELAND
DALLAS	MILWAUKEE	NASHVILLE	PHILADELPHIA	PITTSBURGH	
ST. LOUIS	SAN FRANCISCO	SEATTLE	WINDSOR, ONTARIO, CANADA		

FREE

PUBLICATIONS

Continued from Page 34

offered by this firm are photo-illustrated. *Ryerson Steel-Service*. For more information, check No. 13 on the postcard on p. 35.

Code-Symbol Stamps

Standard code-symbol stamping tools for identifying inspectors, operations, workmen and dates on manufactured parts are described in pamphlet. *M. E. Cunningham Co.* For more information, check No. 14 on the postcard on p. 35.

Keyseating Machine

Specifications, performance data, and price listings on a new type keyseating machine are listed in 2-p. sheet. *Keymatic Machine Co.* For more information, check No. 15 on the postcard on p. 35.

Paint Supply System

A new paint system supplying paint from original containers to spray guns is introduced in 8-p. color brochure. *Gray Co., Inc.* For more information, check No. 16 on the postcard on p. 35.

Agitator

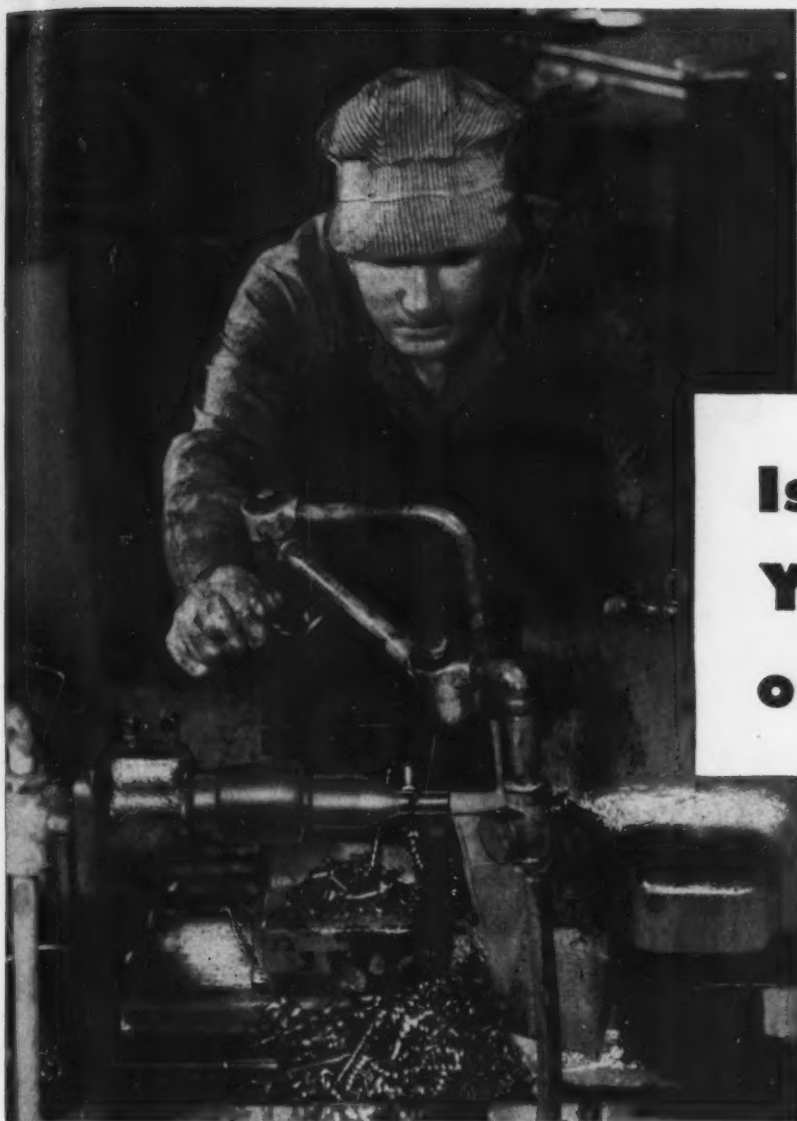
"Pneumix in Action," new 28-p. catalog, lists construction details and shows applications of air-motored, explosion proof agitators for laboratory and production use. *Eclipse Air Brush Co.* For more information, check No. 17 on the postcard on p. 35.

Stud Welder

The Nelson stud welding unit complete with gun and timer unit is described in 4-p. catalog applications are photo-illustrated. *Nelson Sales Corp.* For more information, check No. 18 on the postcard on p. 35.

Industrial Clutches

Detail drawings and photos of Warner ICB clutch and brake units for industrial machinery and electric motor applications are included



Is Machining Your Method of Inspection?

If you depend on machining to locate hidden defects in parts or material, you pay an exorbitant price for "inspection"—through wasted labor and machine time. Further, there may be defects "getting by" that can later cost someone plenty in trouble and dollars.

Machining defective materials is a dead loss! Inspection with *Magnaflux is the modern, economical way that locates defects *before* machining. It is fast, non-destructive and *accurate*. If there is a defect Magnaflux locates it — positively, clearly and unmistakably, whether it is a surface or subsurface crack, a forging lap, a tear, or what have you? Inspection on an engineered Magnaflux unit proves cheaper than even visual inspection, as well as more effective.

Magnaflux inspection is a proved way to turn wasteful losses into profitable operations. That is mighty important to you today. Take just a minute or two right now to write for full particulars.

**Magnaflux, trademark of Magnaflux Corporation applied to equipment and materials for use with magnetic particle inspection.*



M A G N A F L U X C O R P O R A T I O N

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• DALLAS

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DETROIT

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LOS ANGELES

Export Distributor: Curtis Wright Corp.

In Canada: Williams & Wilson, Ltd.

**COULD
ANYTHING BE
MORE CONVINCING
THAN YOUR OWN
EXPERIENCE?**

Then give HERC-ALLOY the toughest chain job in your plant. Our asking for this test reflects the confidence given us by HERC-ALLOY service records from industry's leading plants.



HERC-ALLOY
STEEL CHAIN

HERC-ALLOY is America's **first alloy** steel chain. For slings or other applications **HERC-ALLOY** Chain will prove that efficiency, safety and economy can go hand-in-hand.

COLUMBUS McKINNON CHAIN CORPORATION

(Affiliated with Chisholm-Moore Hoist Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

SALES OFFICES: NEW YORK • CHICAGO • CLEVELAND • SAN FRANCISCO

Other Factories at Angola, New York, St. Catharines, Ontario and Johannesburg, S. A.

FREE PUBLICATIONS

Continued

in 24-p. catalog. **Warner Brake Mfg. Co.** For more information, check No. 19 on the postcard on p. 35.

Flexible Shafting

The Elliot line of flexible shafts, flexible shaft machines, unit drives, attachments, and push-pull controls is listed in 4-p. pamphlet. **Elliot Mfg. Co.** For more information, check No. 20 on the postcard on p. 35.

Instrument Valves

Drop forged steel Edward instrument valves for meter, gage, instrument and other small lines are described and illustrated in 4-p. catalog. **Edward Valves, Inc.** For more information, check No. 21 on the postcard on p. 35.

Industrial Hose

General purpose industrial hose such as air, steam, water, and suction hose is listed and described in 28-p. brochure. **Republic Rubber Div., Lee Rubber & Tire Corp.** For more information, check No. 22 on the postcard on p. 35.

Control Valves

Control of standard air cylinders by 2, 3, and 4-way valves and the incorporation of these valves into existing air systems is described in 12-p. bulletin. **BelloWS Co.** For more information, check No. 23 on the postcard on p. 35.

Steel Deck

The Mahon line of steel deck for roofs, sidewalls, partitions, ceilings, and floors is described in 16-p. bulletin through detail drawings, photos, and text. **R. C. Mahon Co.** For more information, check No. 24 on the postcard on p. 35.

Pump Manual

Revised instructions on the installation and operation of centrifugal pumps in corrosive service is available in 12-p. booklet. **Duriron Co., Inc.** For more information, check No. 25 on the postcard on p. 35.

Resume Your Reading on Page 35

NEW

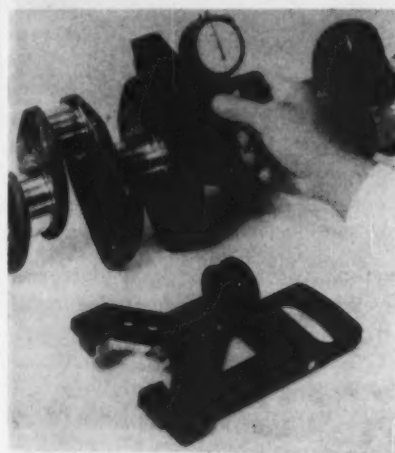
PRODUCTION IDEAS

Continued from Page 38

plate having 6 sets of holes. It will tilt from 5° below horizontal to 30° past vertical axis. Two pins align the tail stock in horizontal position with a head stock. It is vertically adjustable for tapered work. Tail center travel is 1 in. The spindle nose has No. 2 Morse taper socket and 1 in.-10 threads. *Marvin Machine Products, Inc.* For more information, check No. 38 on the postcard on p. 35.

Dial Snap Gage

A new Nilco dial snap gage, designed specifically for checking crankshaft grinding on the machine, features radius guides to clear the maximum fillet and permit the gage to detect any hour-glass



condition or oversize fillet resulting from the breakdown of the grinding wheel. This gage is light and portable, and has indicator graduations of 0.0001. It is possible to apply this dial snap gage to the work and quickly obtain a repeated reading without rocking the gage back and forth. *Nilsson Gage Co.* For more information, check No. 39 on the postcard on p. 35.

Atmosphere Generator

A new, furnace accessory that can be attached or connected to any direct oil or gas fired, batch or continuous furnace is claimed to produce an atmosphere that prevents scale formation in soaking, normal-

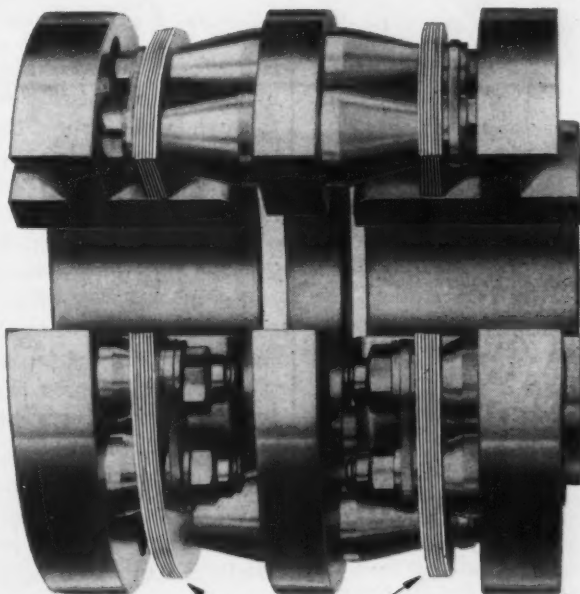
THOMAS Flexible ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: ½ to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



PATENTED FLEXIBLE DISC RINGS

**BACKLASH
FRICTION
WEAR and
CROSS-PULL**
are eliminated
LUBRICATION IS
NOT REQUIRED!

THE THOMAS PRINCIPLE GUARANTEES
PERFECT BALANCE UNDER ALL
CONDITIONS OF MISALIGNMENT.

• • •

NO MAINTENANCE PROBLEMS.

• • •

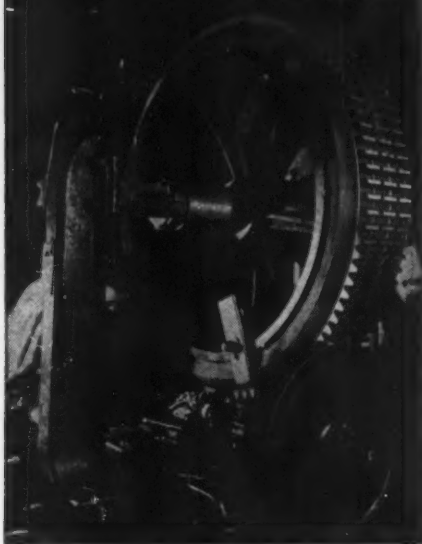
ALL PARTS ARE
SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

LARGE CUT GEARS



Cutting three identical spur gears simultaneously at Simonds Gear.

Cut Gears for Industrial Needs!

For special gears in larger sizes—exact duplicate gears for replacements—for every heavy-duty industrial gear application—look to SIMONDS GEAR where specialty gears for heavy industry have been a custom service for more than 50 years. Within easy shipping distance of many heavy industry plants—with a personalized service designed to meet your most exacting specifications—SIMONDS GEAR provides an unusually prompt and efficient service on even the most unusual gear requirements. Sizes range up to 145" dia. in all popular gear-making materials. Send your inquiry today and get acquainted with SIMONDS GEAR Service.

SPUR GEARS

BEVEL GEARS • MITRE GEARS
WORMS • WORM GEARS
RACKS • PINIONS



Stock carrying distributors for Ramsey Silent Chain Drives and Couplings, V-Belts.

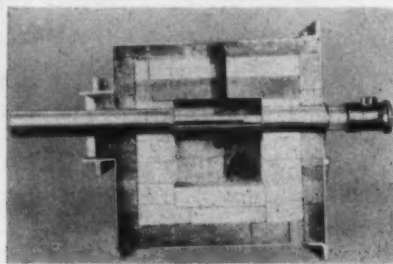
THE
SIMONDS
GEAR & MFG. CO.

LIBERTY at 25TH PITTSBURGH 72, PA.

NEW PRODUCTION IDEAS

Continued

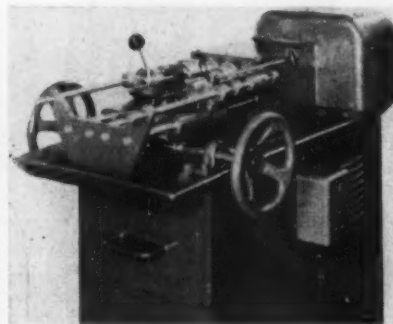
izing, annealing, malleablizing, or heating for hardening. It is also reported to prevent scale formation on the surface of the hot metal during subsequent hot working operations. The equipment is a simple



refractory-lined steel chamber, fired by gas burner or electrically heated, through which runs the Lithium vaporizer tube. A boat containing a cartridge of Lithium compound is inserted into the tube and is heated so that the carrier gas which is also injected through the vaporizer tube picks up the vaporized Lithium and introduces it into the furnace chamber. This carrier gas may be the products of combustion from the furnace or other convenient generated gas. *Lithium Co. For more information, check No. 40 on the postcard on p. 35.*

Bolt Threader

Designed for the rapid threading of screw blanks and other milled, upset or forged parts, the Kent BT2 two-spindle bolt threader drives threading spindles at 1200



rpm through change gears from its 2-hp motor. The threading spindles are equipped with two revolving type, hardened and ground thread chasers for normal work up to 1-in. diam. Claimed advantages are minimum necessary operating

skill, continuous threading on long runs, quick changeover from one job to another, and resultant low threading cost per piece over a wide range of work. *Kent Machine Co. For more information, check No. 41 on the postcard on p. 35.*

Loading Platform

Savings in truck loading time and dock space are possible through the use of dock leveling equipment. Bringing the dock level with the truck floor facilitates rolling hand or power trucks into the body of the carrier, permitting easier and faster handling of palletized loads, small parcels and heavy or hard-to-handle shipments. Speeding the transfer of loads between truck and dock offers economies by reducing truck loading time and manhours for drivers and dock workers. It increases dock capacity without additional space, reduces truck waiting time and improves the safety



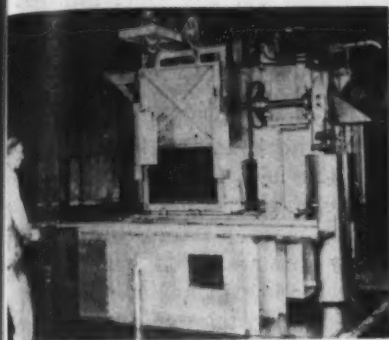
factor. Adjusta-Dock is a platform-leveling device easily installed in existing docks. Pushbutton control of the hydraulic ram quickly brings the loading platform level with the truck floor. *Rowe Methods, Inc. For more information, check No. 42 on the postcard on p. 35.*

Batch Type Furnace

High production capacity is claimed for a new batch type furnace developed for all types of controlled atmosphere heat treatment of steel. The furnace is available with the built-in RX atmosphere generator to provide for gas carburizing, homogeneous carburizing, dry (gas) cyaniding and carbon restoration, clean hardening and general heat treating. Work is carried in and out of the furnace on four trays that are moved by alloy screws. A lowerator quench mechanism provides semi-automatic op-

ong
one
low
wide
Co.
No.

eration for the charging and dis-
charging of the furnace. Fast heat-
ing rates developed by the use of
radiant tube firing, combined with



a fan to circulate heated, prepared
atmosphere, provide production up
to 200 lb per hr gross loads per sq
ft of area. Maximum gross charge
capacity is 2500 lb. *Surface Com-
bustion Corp.* For more informa-
tion, check No. 43 on the postcard
on p. 35.

Respirators

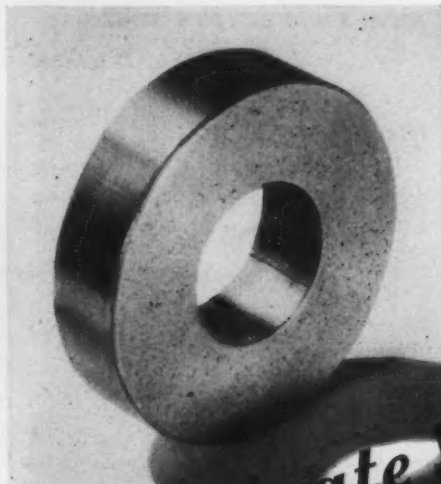
Twin cartridge respirators pro-
vide protection against seven respi-
ratory hazards through a basic face
piece and seven interchangeable
filters. The seven filters that screw
into the respirator's twin filter hold-
ers, protect workers against dusts,
vapors and gases. The face piece is
molded from durable rubber and
has a rolled edge that curves inward
to give a snug fit without leakage.



Other features include a flexible
fitting brace for shaping the respi-
rators to individual features, an
efficient inhalation and exhalation
system and increased field of vision
through thinner filter cartridges.
American Optical Co. For more in-
formation, check No. 44 on the post-
card on p. 35.

Turn to Page 156

December 8, 1949



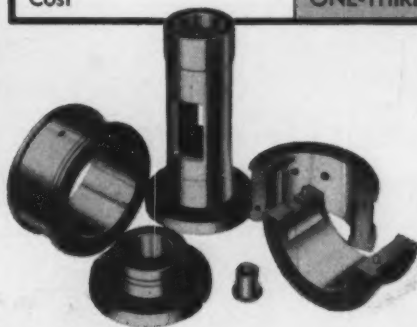
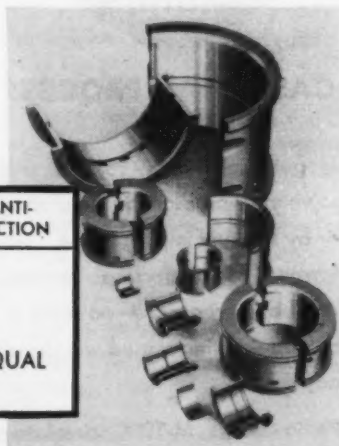
when
low cost
is
important

Investigate **JOHNSON**
SLEEVE BEARINGS

YOU may be looking for a means of reducing
the cost of parts and assembly time on equipment you manu-
facture. Here is an example of how Johnson Bronze can help.
The sleeve bearing illustrated above was produced to replace
an antifriction bearing in an important automotive applica-
tion. It delivers equal or better performance yet costs *only*
one-third as much. Multiply this saving by the thousands of
units in which it is installed and you will quickly see the
importance of the substitution.

check these
important facts

	JOHNSON SLEEVE TYPE	ANTI- FRICTION
Running Friction	LOWER	EQUAL
Load Carrying Capacity	GREATER	
Resistance to Pounding	GREATER	
Precision	EQUAL	
Cost	ONE-THIRD	



SLEEVE BEARINGS by Johnson
Bronze are designed by engineers of
long practical experience and years of
metallurgical and mechanical research.
Numerous leading manufacturers con-
sult our specialists before designing or
redesigning mechanical equipment.
Such firms benefit by high bearing per-
formance and low unit cost. You, too,
are invited to write or to consult per-
sonally on bearing requirements with
these Johnson Bronze Engineers.

Johnson Bronze
SLEEVE BEARING HEADQUARTERS
505 SOUTH MILL STREET : NEW CASTLE, PA.

Leaking Pressure Castings Salvaged!



WITH THE



CAST SEAL PROCESS

Mogul Cast Seal Process will solve your problem by circulating or by vacuum impregnation. All ferrous or nonferrous castings can be impregnated—no muss or baking—casting sealed will stand any test.

Photo shows M-1000 circulator used for testing and impregnating pump castings.

Write for full details

METALLIZING
COMPANY OF AMERICA

3520 W. CARROLL AVE.

CHICAGO 7, ILL.

NEW PRODUCTION IDEAS

Continued

Strapping Truck

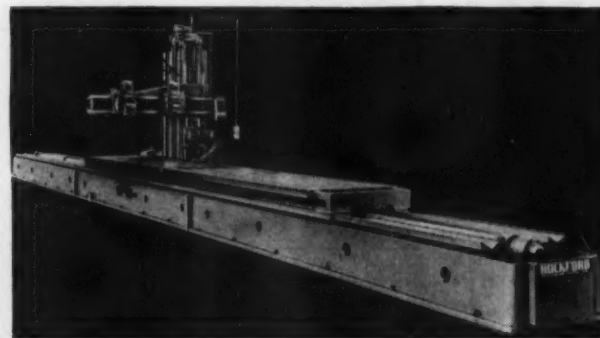
Heavy gage round steel strapping coils up to 150 lb can be carried on a new easily - maneuvered hand



truck, usable from a horizontal or vertical position. The strapping may be unreel clockwise or counter-clockwise and can be held in place without accidental unreeling by inserting the loose end of the coil in one of three holes in the circular coil cover. It has a 4:1 lifting ratio, with 38 lb lifting pressure exertion on each truck handle. *Gerrard Steel Strapping Co. For more information, check No. 45 on the postcard on p. 35.*

Openside Planer

A 33-ft cutting stroke with infinitely adjustable speeds up to a maximum suitable for carbide cutting tools features the new Rockford Hy-Draulic openside planer. Speed of the return stroke may be set independent of the cutting stroke speed. The machine is built with two cross-rail heads and one side head. Maximum planing width

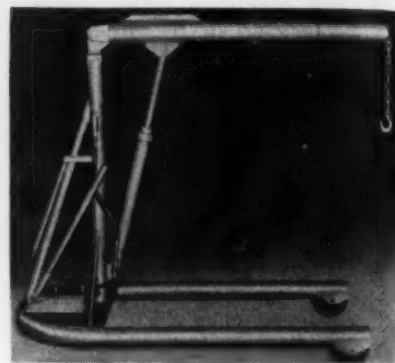


for the right hand head is 60 in.; planing width, including the use of the left hand head is 72 in.; and distance of table to rail is 72 in. Single column and cross-rail as-

sembly provide rigid support for the tool heads and permits overhang setup of work. The planer is 73 ft long x 14 ft high. *Rockford Machine Tool Co. For more information, check No. 46 on the postcard on p. 35.*

Hydraulic Floor Crane

For shops having limited floor area the new Ruger Half-Tonner hydraulic floor crane gets into extremely close quarters, turns completely around in its own length, and can work in a 3-ft aisle. Its three-position telescoping boom extends reach from 46 to 58 in. Lifting capacity with boom closed is 1000 lb, with boom fully extended, 500 lb. Double acting pump works



both on forward and back strokes. Six-inch diam load carrying wheels and 4-in. diam steering caster wheels feature ball bearings. *Ruger Equipment Co., Inc. For more information, check No. 47 on the postcard on p. 35.*

Rust Preventive

A rust preventive for use on aluminum, chrome, ferrous, and nonferrous metals provides a coating over plated parts and bare metal. It is a clear, transparent coating that dries quickly without need of baking. It expands and contracts with metal regardless of temperature extremes, intense vibration, or abnormal flexing. *International Rustproof Corp. For more information, check No. 48 on the postcard on p. 35.*

Resume Your Reading on Page 39

THE IRON AGE

New Officers Elected By Packaging, Handling Society

Chicago — R. C. Sell, general traffic manager of the Koehring Co., Milwaukee, has been elected president of the Society of Industrial Packaging and Materials Handling Engineers for 1950 and 1951. Results of a letter ballot election were announced at the board meeting here by R. J. Bayer of Traffic Service Corp., chairman of the society's nominating committee.

Mr. Sell has been a vice-president of the national society for the past 2 years.

Other newly elected S.I.P.M.H.E. officers include Paul O. Vogt of General Electric Co., Schenectady, N. Y., who was elevated to the newly-created post of vice-chairman of the board. Mr. Vogt just concluded his second year as the society's president. R. F. Weber of International Harvester Co., Chicago, was reelected as chairman of the board.

The newly-elected executive vice-president is Stanley Price of Western Electric Co., Chicago. Three regional vice-presidents were elected as follows: W. Gordon Bennett of Anaconda Copper Mining Co., New York (eastern); J. H. Singer of National Container Corp., Columbus, Ohio, the only reelected vice-president (mid-western); and Gale C. Cunningham of North American Aviation, Inc., Los Angeles (western).

J. L. Ware of Sears, Roebuck & Co., Chicago, was retained as the society's treasurer and H. E. Brill of Mid-States Container Corp. becomes the newly-elected secretary.

Marshall Plan Imports Rise

Washington — General imports from the Marshall Plan countries increased from \$56 million in August to \$69 million in September, including shipments from Turkey.

At the same time, exports to the 17 ECA nations rose to \$289 million from the August \$278 million. This was somewhat below the 1949 average of \$391 million.



TOWMOTOR Electric Pallet Truck

selected by **WRIGLEY**

for speed . . . maneuverability . . . ruggedness

Producing millions of sticks of chewing gum every day—billions every year—necessitates the unloading, storing and transporting of a staggering amount of materials. This is the problem at the Wm. Wrigley Jr. Company's giant Chicago plant—the world's largest chewing gum factory.

To help maintain top efficiency in a competitive industry, Wrigley must be constantly alert to new developments in the materials handling field. That's why Wrigley selected Towmotor Electric Pallet Trucks to augment its handling equipment.

One of the grueling tasks is to transport and store 2400-lb. pallet loads on an inclined floor. The floor is rough board surface at an 8° angle. Towmotor is the only truck with enough power to handle full loads rapidly over this area!

In actual operation, Towmotor travels faster under heavier loads . . . weighs less, carries more . . . climbs grades more readily . . . stands up under constant daily use.

Check these outstanding Towmotor features:

- Dual Finger-tip Control—either hand.
- Positive Brake—vertical and horizontal.
- Automatic power cut-off when brake is applied.
- Rapid lifting of loads up to 4000 lbs.
- 3 Point Suspension—for smooth travel, easy maneuverability.

Write for the descriptive folder on Towmotor Electric Pallet Trucks. Learn how Towmotor Mass Handling methods can cut production costs and save money for you. Towmotor Corp., Division 15, 1226 East 152nd St., Cleveland 10, Ohio. Representatives in all Principal Cities in U. S. and Canada.



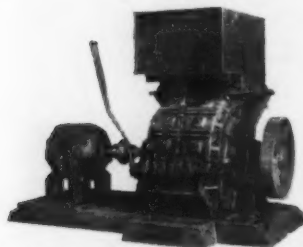
**FORK LIFT TRUCKS
and TRACTORS**

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

YOUR METAL TURNINGS LOSS OR A PROFIT?

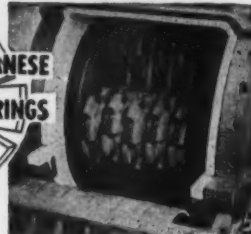
The rapid reduction of long, curly, hard-to-handle turnings into short shoveling chips with Americans solves handling and storage problems. The low cost at which Americans operate makes their installation highly profitable. The yield of cutting oil is increased 30 to 50 gallons per ton. Alloy steel, carbon steel, aluminum, brass, and bronze turnings are reduced to uniform chips by Americans in capacities from 1 to 10 TPH.

Only Americans have shredder ring action that assures uniform chips and prevents clogging and stalling.



Send for "Metal Turnings Bulletin"

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NEW YORK PHILADELPHIA CLEVELAND DETROIT AKRON CHICAGO
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• News of Industry •

New Jersey Chapter Of ISIS Elects New Officers

Newark, N. J.—Paul Giordano, Giordano Waste Material Co., Trenton, N. J., was elected president of the New Jersey chapter of the Institute of Scrap Iron & Steel Inc., at a meeting of the chapter at the Hotel Essex House, Newark, on Nov. 10.

Irving Bussel, Plainfield Iron & Metal Co., Plainfield, N. J., was elected first vice-president; Henry Fiestal, Paterson Steel & Baling Co., Paterson, N. J., was elected second vice-president; Herman Plavin, Jacob Plavin & Sons, Perth Amboy, N. J., was elected third vice-president; Eli Bussel, Plainfield Iron & Metal Co., was elected treasurer; and Murray Kunin, Schiavone-Bonomo Corp., Jersey City, was elected secretary.

The executive committee will consist of George Rubine, Hudson Iron & Metal Co., Bayonne, chairman; Emanuel J. Moskowitz, Schiavone-Bonomo Corp., Jersey City; Frank Contey, Frank Contey, Inc., Jersey City; Michael Levine; William Abramson, A. Abramson & Sons Inc., Newark; and Abraham Goldberg, Harry Goldberg & Sons, Perth Amboy.

Heads Safe Transit Program

New York—Dudley Jones, Kaiser Metal Products, Inc., has been named chairman of the Laboratory Coordinating Div. of the Porcelain Enamel Institute-sponsored National Safe Transit program.

Mr. Jones joined Kaiser in November of last year as materials and transportation superintendent, and is in charge of all phases of the company's warehousing, receiving, shipping, traffic, materials-distribution, and packaging problems. He was formerly sales promotion manager for Woodbury Wholesale Hardware Co.

The PEI National Safe Transit program was inaugurated about 2 years ago to reduce in-transit damage to finished metal products. Since then the program has received the endorsement of national carriers, manufacturers' associations, and packaging groups.



Dear Customer

by *Jack R. Hight*

DUE RECOGNITION — We have harbored an idea that many leaders in American industry deserve a lot more credit than they get for the singlemindedness with which they pursue their jobs in industry. For this reason we are trying to do something about it in our annual issue Jan. 5, the Metal Fact Book.

We are asking our readers, through ballots in *THE IRON AGE* and by mail, to vote for their nominations for Men of the Metal Industry. They will be suitably recognized in the first issue of January. There is a ballot for your convenience over on p. 161—why don't you fill it in with the names of two men you think have been doing an exceptional job for their part of the metals industry.

We should have appended a note on that ballot saying that "employees of *THE IRON AGE*, members of their families, or their families' families, or their families' families' advertising agencies ain't able to win—so don't vote for them." That message is particularly included for the edification of Luria Bros. vice-president, Amos Bowman, of Pittsburgh, who has already nominated Tom Campbell, our editor. We are sending Mr. Bowman another ballot to let him try again.

BASIC DIFFERENCE — A paragraph from London in our Global Letter of Nov. 24, p. 28 points up a basic difference between the trade

press here and abroad.

The passage we refer to, in discussing the conclusions of the Anglo-American Council on Productivity states that "The technical and trade press of America made a substantial contribution (to industrial standardization) by giving publicity to successful efforts of industries and individual concerns." It goes on to say that "Generally, manufacturers in the U. S. A. are willing to have their work and its results widely publicized. This is deemed to be an important factor in the development of high productivity and low costs."

No more eloquent tribute to American industrial wisdom and American industrial journalism could be made. It may be, though, that there is more to this than the manufacturer in this country being willing to publicize his work. A lot of effort has been made by good trade magazines here to persuade manufacturers of the long term as well as short term values of free discussions of new processes and materials.

There are some places where "trade secrets" are a feature of the business, and no outsider ever gets into a plant, but relatively few of them. But in the nations across the Atlantic, that is still a dominant attitude in a great many firms. Naturally chauvinistic by nature, we think the good old American "invent and tell" kind of operation is best.

wonderful

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Composition

No. 90

for

reverse-current cleaning

You never know how good an electrocleaner can be until you watch Oakite Composition No. 90 go to work on oils, greases, smuts, all the objectionable films that interfere with good electroplating on steel.

"No. 90" makes a wonderfully well-balanced solution that does everything just right. It has high conductivity that keeps oxygen bubbling off the work. It raises a thin blanket of fine bubbles just strong enough to keep the alkaline spray from being a nuisance around the tank; just brittle enough to break before the foam becomes too thick and too explosive. For wetting action, for water-softening, for every useful purpose, the ingredients of Oakite Composition No. 90 have been selected with care and apportioned with precision. Result: A solution that is perfect for reverse-current cleaning.

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30H Thames Street, NEW YORK 6, N. Y.
Technical Service Representatives Located in
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OAKITE

Specialized Industrial Cleaning
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Geneva Recalls All Workers; Other Contracts Being Negotiated

Salt Lake City—All workers who were out on strike have been recalled by Geneva Steel Co. and operations are back to virtually the prestrike level. In the fabricating field settlements have not yet been reached in a few cases.

The United Steelworkers of America are currently negotiating with Pacific States Cast Iron Pipe Co., Republic Cresote, General Refractories, Griffen Wheel Co. and the Ogden Iron Works. The Bethlehem formula is being demanded in all instances. The union settled with American Can in Ogden prior to the settlement in basic steel.

Mine Union Being Absorbed

All fabricators of the area whose employees are represented by the AFL Structural Steel & Iron Workers or the International Assn. of Machinists have negotiated new contracts.

The steelworkers union, incidentally, is in process of absorbing the Progressive Metalworkers, the union organized by nonferrous metal industry locals which walked out of the International Union of Mine, Mill & Smelter Workers. Four locals in the district (Utah and Nevada) have voted to affiliate with the steelworkers. They are the Park City, Spanish Fork and American Gilsontite in Utah and the Pioche in Nevada. Twelve locals are still to act on the proposition.

The Progressive Metalworkers have heretofore maintained their affiliation with CIO through the Marine and Shipbuilders International. This arrangement was recognized as temporary at the time it was entered into. The invitation for the mine workers to enter the steelworkers union on a permanent basis was extended following the national CIO convention in Cleveland. Presumably the top command of the CIO concluded there would be fewer complications in absorbing the nonferrous metal industry unions.

"New Process" Punches • Dies • Rivet Sets Compression Riveter Dies Chisel Blanks

Made from high-grade alloy tool steels properly heat-treated of uniform high quality — may be purchased with complete confidence for maximum service.

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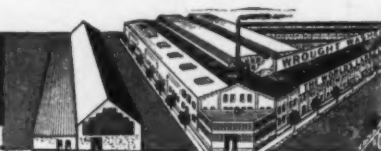
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WHOM DO YOU CHOOSE?

First Men of Industry Selection

Name Your Choices

To focus attention on the contributions made by American industry to the nation's welfare, The Iron Age editors will conduct a poll of its readers to identify the outstanding

Men of Industry for 1949

Readers of The Iron Age, representing some 17,500 metalworking plants, will be asked to indicate the men they consider as having made especially significant contributions in 1949. The choice is not limited to classes of men...those selected may be either management, production or engineering personnel.

Balloting will close on Dec. 16, to permit tabulation and publication of results in The Iron Age annual issue of Jan. 5, 1950.

The ballot below is for the convenience of readers who may not be reached by mail.

Men of Industry Poll
Iron Age
100 East 42nd Street
New York 17, N. Y.

*MY NOMINATIONS FOR IRON AGE'S OUTSTANDING MEN OF THE METAL INDUSTRY ARE:
(PLEASE PRINT)

Name _____	Name _____
Title _____	Title _____
Company _____	Company _____
City _____ State _____	City _____ State _____

*give full name and
company affiliation

Signed _____
Company _____

Canadian Railways Place Orders for Diesel Locomotives

Toronto—Canada's two major railway companies have placed orders for a total of 66 diesel locomotives to be built in Canada.

N. R. Trump, vice-president of the Canadian Pacific Ry. Co., stated that the company has placed orders for 58 diesel locomotives to cost \$12 million. This is the largest order ever placed in Canada for this type of equipment.

Of the 58 units for C.P.R., 44 will be built by the Montreal Locomotive Works, Montreal, and are of the model of diesel locomotives produced by the American Locomotive Co. of Schenectady. The remaining 14 locomotives will be built in the New London, Ont., plant of General Motors Diesel, Ltd., and will be similar to those built by GM at LaGrange, Ill.

The Montreal Locomotive Works order calls for 20 streamlined Alco-G.E. design, 1500 hp, road

freight "A" units; 20 streamlined Alco-G.E. design, 1500 hp, road freight "B" type and four Alco-G.E. design, 1500 hp, road switching locomotives. Delivery will start early next year with the full order to be completed by August.

General Motors will build 10 streamlined 1500 hp, freight passenger "A" units and four 800 hp, yard switching locomotives for delivery between July and September, 1950.

E. A. Bromley, vice-president of the Canadian National Railways, reported that C.N.R. had ordered eight road diesel engines of 1500 hp each from Montreal Locomotive Works, scheduled for delivery in January and February. These will be the first road diesels produced in Canada, he said, and the order will bring to 46 the number of diesel locomotives bought by C.N.R. this year.

The diesel locomotives for both C.P.R. and C.N.R. will be used on freight trains.

Railroad Revenue Decreasing

Chicago—The Assn. of American Railroads has reported that the 81 Class I railroads of the country experienced a drop in revenue in October of 24.8 pct as compared with the same month in 1948. The estimated freight revenues alone showed a drop of 26 pct on the same comparison.

It is believed that much of this drop was due to the national strikes occurring during October, as the previous month's statistics had not shown that big a decrease in operating revenue.

For September of this year the estimated railroad operating revenues were off 16.6 pct compared with the same month in 1948. The estimated freight revenue for this period on the same comparison had decreased only 17 pct in September.

The AAR's compilation shows that the drop in revenue is much greater in the Eastern District than it is in the Southern Region and Western District.

Hydramatic Price Lowered

Detroit—The price of automatic transmissions for passenger cars is coming down.

Oldsmobile and Pontiac Divs., which use GM's Hydra-Matic drive, have already announced price reductions of \$25. Cadillac, which also uses Hydra-Matic, has made no announcement but is expected to make a similar adjustment in the price of its 1950 models which went into production recently.

Hydra-Matic transmission will sell at \$158.50 on the 1950 Pontiac line.

Doubles Iron Ore Production

Seattle—Washington State produced more than twice as much iron ore in 1948 as compared to 1947 according to the U. S. Bureau of Mines. Production for 1948 was 5364 tons as compared to 2268 tons in the previous year. Total production in the United States for 1948 was reported by the bureau as 126,225,172 tons.



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MACHINE MANUFACTURING COMPANY
PITTSBURGH (23), PA.

Capacities
50 tons up

21

Canadian Steel Business Brisk; Britain Eyes Market

Toronto—Business continues at a brisk pace in the Canadian steel markets. There is no indication of abatement in demand for the next 6 months at least.

The steel strike in the U. S. was reflected in increased order placing with Canadian mills by consumers that usually obtain most of their supplies from across the line. At the same time restriction on imports, which call for heavy outlay of U. S. dollars, also is a factor in throwing a larger volume of business to Canadian steel producers. Dollar devaluation which brought a 10 pct increase for U. S. steel shipped into Canada also has had a tendency to swing more buying into domestic steel lines.

Steel mills in Ontario continue at virtual production capacity. They are now fully booked through the first quarter on such items as flat-rolled products and carbon

steel bars and there is an especially heavy demand for cold-rolled products. Insofar as alloy steels are concerned, however, supply is somewhat ahead of demand.

Canada has been drawing approximately a million tons of steel annually from the U. S. It now is apparent the British steel producers plan to take a big slice of this business, possibly a fifth of the Canadian market, from the States. The first step in this direction already has been taken by representatives of the British Iron & Steel Federation, headed by Sir George Binney.

However, the goal of the British steel interests is the specialty steel markets, and the campaign will be directed chiefly at American mills supplying the Canadian market with steels of a type and kind not made in Canada. It is stated there will be no encroachment on products of the Canadian mills.

Canadian Mineral Industry Setting New Production Record

Toronto—Canada's mining and mineral industry will produce \$900 million this year—a great addition to the national wealth. Sparked by the recovery in gold mining, where output has risen \$25 million in the year, and by nickel, copper, lead, and zinc, which add an extra \$50 million, the industry is predicted to break all records in 1949.

Total production in 1948 was \$806 million; 10 years ago, \$474 million. Dividends, too, keep moving up. The expected total is close to \$120 million, greater by far than the disbursements of any other Canadian industry. Mining's all-time dividend aggregate is approaching \$2 billion.

Almost every phase of mining shows expansion. Iron ore output, vital in Canada's new industrial economy, has expanded twenty times since 1939, and should rocket even higher in 1950. Three new young giants have joined the base metals list. Gold mining, thanks to devaluation, appears to have a possible production of \$180 million in sight next year.

These are a few statistical highlights from the Annual Number of The Northern Miner, published here recently.

Building Pace Remains High

Los Angeles — Building continues at a brisk pace here with fabrication industries expected to enter major competition for two of the biggest jobs.

Contracts will be awarded in January for the \$18 million Hotel Statler. Passage of a \$5 million county bond issue makes possible the construction of a communicable disease hospital and nurses home to specialize in polio cases.

Plans for the 13-story Statler building were drawn by Holabird, Root and Burgee, Chicago architects-engineers, and provide for a three-level underground garage accommodating 465 automobiles in addition to 1320 rooms and 40,000 sq ft in dining and ball rooms.

FUMES and HEAT present NO Operational Problems



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Designed and equipped especially for efficient operation over furnaces or other equipment and machinery where high temperatures and noxious fumes are present. An air-conditioning unit removes dust, cools the air and neutralizes fumes with activated carbon filters. Other special features include: slip ring motors with glass insulation and thermo guards; protective baffle plate under trolley and thermo pane windows.



Side view of cab showing air-conditioning unit mounted above on catwalk.

Write for complete information
and specifications.



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FATIGUE CRACKS

Continued

That's all it was, of course—just gravel. But to this day, when you watch the rays of the setting sun bounce back onto the water from the pyrites cliffs that border Gold Lake, you'd swear there was a fortune lying on the bottom.

We hadn't thought of the story for years until we recalled that the old prospector, who received a good round sum for his claims, had returned East to go into business. Then we heard the story of the Buffalo nuggets and couldn't help but wonder if he hadn't started a brass foundry.

Apronym

W. R. Black, we learn, is assistant sales manager at New York for Koppers Company's tar products division.

Puzzler

In the dim past, when this department enjoyed the stimulating guidance of Arthur H. Dix, puzzles or brain twisters were a weekly feature. For our part, we never had the brains to cope with anything more difficult than freshman algebra and have attempted to ignore the fact that most of our readers are walking IBM machines.

Whether we hear an ominous low rumble of protest from the

multitude or a loud roar from a few, we can't quite make out. As a test, we're tossing out this one, just to find out how many send in the correct answer (good, incidentally for a free copy of your *i.f.j.'s* Metal Industry Fact Book edition, off the press Jan. 5):

Our young son started down the road with a sack of marbles. When he stooped to pick up a penny, he dropped half his marbles, plus half a marble. This so unnerved him that he dropped the penny together with half the remaining marbles plus half a marble. Stooping for the penny again, he dropped half the balance of the marbles plus half a marble. He got the penny this time, but he had only one marble left. How many marbles did he have when he started? (No marbles were broken nor did he break any.)

Just to show how few marbles we have left, you can get the answer another way by adding the ages of our three children and subtracting 9.

Authorizes Industrial Goods

Washington — Industrial goods continue to be the major procurement items authorized for Marshall Plan purchase as ECA recently approved another total of \$60 million in procurements to

bring the cumulative total to \$7.4 billion.

Recent industrial approvals mounted to \$43.6 million including \$15.2 million in industrial machinery. This included \$2.2 million in factory and office equipment and parts for Sweden and another \$8.5 million worth for Britain, \$1.5 million worth of motor vehicles and engines for Sweden, and \$650,000 worth of metalworking equipment for Britain.

Kodak Film Shows Role Of Modern Photography in Industry

Rochester, N. Y.—A new motion picture describing the role of modern photography in industry has been released by the Eastman Kodak Co., Inc., for showings before industrial groups and technical and engineering societies.

Entitled "Functional Photography in Industry," the motion picture provides a survey on film of the ways in which photography today is serving industry in research, production, quality control, advertising, and sales.

According to Paul Barbee of Kodak's Industrial Photographic Div., this new film is the first major survey of its type. "The movie was made," Mr. Barbee explained, "by going to U. S. industry and filming proved operating procedures which involve the use of photographic techniques."

Show Gas Turbine Prime Mover

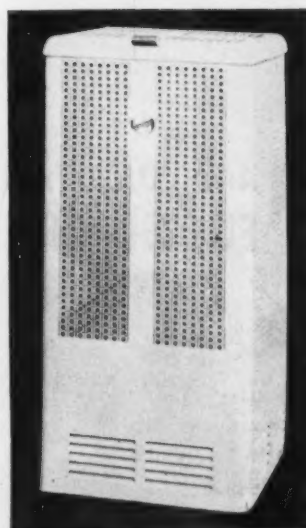
London — The first British gas turbine designed throughout as a prime mover for industry was shown recently here. The exhibit was a scale model of the prototype installed in the power house of the works of Ruston and Harnsby, Ltd., Lincoln, England.

The machine has been developed for general purposes and has a continuous full-power rating of more than 1000 bhp. Its compressor delivers air through a heat exchanger to twin combustion chambers. The products of combustion are led to two separate turbines, the first of which drives the air compressor, while the second forms the power unit from which the drive is taken.

Ornamental Perforated Metal

A particularly attractive application of Hendrick Ornamental Perforated Metal is its use for stove panels, as shown in the illustration of a model manufactured by the Queen Stove Works, Inc., of Albert Lea, Minn.

Hendrick offers a wide variety of decorative patterns, regularly furnished in steel sheets of available stock sizes, in gauges from 16 to 22. These patterns can also be supplied in other metals on special order. Write for full information.



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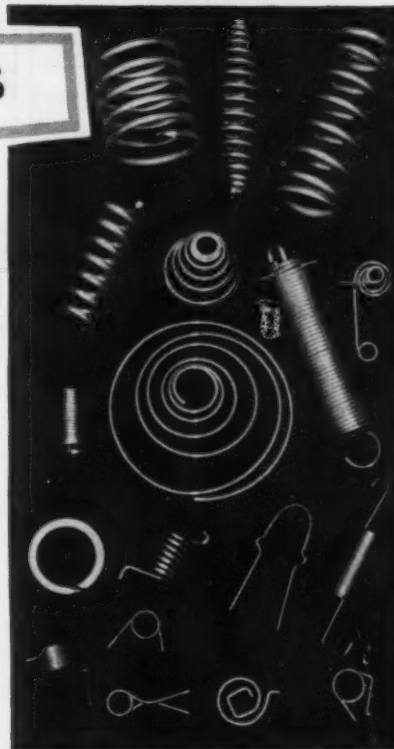
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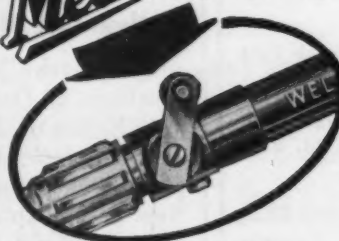


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there's no torch like the

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The famous MECO "On-Off" Action (above) allows a tiny pilot light to burn at the tip with the action in the "off" position. At a touch it flashes to full production flame. Action tested over 200,000 times without appreciable sign of wear.

For mass production there is no such thing as a good all-round torch. Time and motion studies have proved that for efficient production welding, the torch used must be fitted to its particular job. The Meco AUTOMAT family—embodying the famous MECO "On-Off" action (oval), is perfectly suited to the start and stop welding so common to production. The importance of this time saving feature to mass production work is apparent. Beyond this, each member of this family has built-in features perfectly suiting it to its own particular class of welding.



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PLATE STRAIGHTENING ROLLS—60" McKay 11 Roll
8' Newbold 11 Roll

PRESSES—2800 Ton Bliss Hydro Dynamic Press, 12" Stroke, 60" Between Rods
500 Ton Verson Single Acting Press, 8" Stroke, 42" Between Columns

PUNCH & SHEAR COMBINATIONS—#0 Buffalo Universal Ironworker, Capacity Punch ⅝" x ½", Shear Plate ⅝", Flat 4" x ½", Sq. 1⅝" Model 91 Size 16 Hercules

Universal Ironworker, Capacity Punch 1 1/16" x ⅝", Shear Plate ⅝", Flat 6¼" x ¾", Angles 6 x 6 x ⅝", Rd. 1⅝", Square 1¾"

SHAPER—66" x 78" Whitcomb Portable Shaper

SHEAR—BAR—No. 4 Kling Guillo-tine Type, Capacity 3" Rd, 2⅝" Square

SHEAR—ROTARY—No. 100 Kling Rotary Shear, M.D., Capacity Shear 1" Plate, 48" Throat

TUBE MILL—Lobely Tube Mill, Capacity 3½" Dia. Complete with 5-Roll Straightener and Flying Cut-Off

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THE CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Automatic transmission tooling prospects fade

New York MDNA meets Fox

New Jersey dealers call 1949 a bad year

Mixed trends reported in Detroit

Hopes Fade for Automatic Transmission Tooling Business

Detroit — The decision of a second automatic transmission manufacturer in the Detroit area to use new equipment exclusively has further dampened the hopes of used machinery dealers who had looked upon this retooling operation as a lucrative source of business. It is now realized that the specialized nature of the equipment needed to produce these parts has been an important factor in buyer's decisions. Dealers feel that these decisions indicate a trend and therefore are resigning themselves to the fact that the expected business in the last quarter of the year will not come from these sources.

Lunney Introduces Fox To New York MDNA Chapter

New York — Frank Lunney, president of the Machinery Dealers National Assn., introduced J. M. P. (Jack) Fox, the newly appointed executive director, to the New York chapter at their regular meeting Monday, Nov. 28. Mr. Lunney outlined the background and qualifications of Mr. Fox and mentioned that there would be some positive action in the near future on all MDNA objectives. Mr. Fox mentioned that suggestions and recommendations sent to national headquarters in letter form would be welcomed and would be given his personal consideration.

The regular business meeting, with chairman Ed Schill presid-

ing, discussed the convention yearbook, the new dues plan, and means for increasing membership. The next meeting will be held on Monday, Dec. 19 at Cavanagh's.

1949 Business Off Sharply New Jersey Used Dealers Report

Newark—Dealers in this area generally concede that 1949 has been a bad year as compared to previous years. It is reported that in comparison to 1948 their total business dropped 10 to 50 pct, depending upon the dealer and his scope of operations. The increased activity in light and medium production units starting in September slowed after mid-October, although a few dealers still report business up to 60 pct above the July low. Heavy units started moving in October; sales volume on these reported by most firms is now from 30 to 40 pct better than July and the outlook still seems favorable.

Realizing that the seller's market is over, the firms who report activity admit that they go out and hustle for the business they get. Most dealers in this area have resigned themselves to the fact that the market has reached its leveling-off point and that the

Turn to Page 174

MDNA CHAPTER MEETINGS			
CHAPTER	DATE	TIME	PLACE
Detroit	Tues. Dec. 13	7:00 p.m.	Hackett Co.
Chicago	Fri. Dec. 16	6:30 p.m.	Hyers' Restaurant
New York	Mon. Dec. 19	6:30 p.m.	Cavanagh's
Philadelphia	Wed. Dec. 21	6:30 p.m.	Warwick Hotel
Los Angeles	Tues. Dec. 27	8:30 p.m.	Elks Club
* Special Christmas Dinner Party			

THE CLEARING HOUSE



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Brown & Sharpe #600, H.S. #4 & 6
Cincinnati 8 sp. 1 1/2" cap.
New Britain Gridley 61-2 1/4" & 6 sp.

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Lucas #31 horiz.
Universal 3" horiz. equipped

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Cincinnati Sup. Ser. 21", 24"
Reynolds Excelsior 21": Feet Burt 6 sp.
Norton Model E-5 Multi-Spindle, 14 Spindles
Canedy-Offe 3"-9" col.
Carlton 8"-19" col.; Allen 6 sp.

ENGRAVERS

Gorton #30, 32, 2 dimensional, 2L, 3 dimensional
Gorton Cutter Grinders 375-2, 260-6
DeKalb 61

GEAR EQUIPMENT

Fellows #7, #72, #725 High Speed Shapers
Milner Gear Hobber
Fellows, Michigan, Gleason Cheekers

GRINDERS, MISCELLANEOUS

Brown & Sharpe #5 cyl., 3" x 18"
Brown & Sharpe #1, #2 Univ. #13 Tool
Cincinnati #2 Centerless Filmatia, 12 x 36 Univ.
Cinn. 12 x 48" Univ., Gardner #226, 38" dia.
Covel #91A Unit. Tool & Cutter, Hammond #4
Hend 72A3 Int. Centerless Sizermatia, #1 Tool
Landis #4H Cyl. 4x12", Centerless, #6 Thread
Norton #2 Tool & Cutter, Type C, 8x38"
Oliver #516 Drill Pointer, Sellers 4G, Black D'mond
Patt & Whitney Radius #18, K.O. Lee Tool
Porter Cable Belt WGB, 68; Greenby Int.

GRINDERS, SURFACE

Abrasive #1 1/2" Wet Hand Feed, #33, #34, Vert.
Blanchard #18, 42" Mag. Chuck, #11-16" chuck
Brown & Sharpe #2
G. & L. #25, #35 Hyd. Feed
Hanscott 300 series, 13x48" with chuck
Mattison 14x16x48 with chuck; Hammond #2
Norton 6x18" Hyd., Atlantic 6x18" Power Feed
Reid #2A P.F. #18, #2C Pope Sadi.
Patt & Whitney 12x38" Vert.
Thompson Hyd. 8x10x18", 6x12x18"

LATHES

Hardinge Precision 9", 1" Collot Cap., Rivett
Hendy G.H. 18x36", Rel. Att., Bradford 18"x36"
LeBlond Regal 18x36", 21x60", 18"x3 1/2", 19x48"
LeBlond Heavy Duty 18x36"
Lodge & Shipley 18x78" T.A., Collots, etc.

This is but a partial listing. Write for free Catalog. Inquiries invited.

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High Speed Vertical Mill

Monarch 10"x20" E.E. 18x78 G.H., 12x30"
Sebastian 12"x4" G.H.
Sheldon 11"x24", Logan 10"x30"
South Bend 13x58", 14"x8", 10x4, 9x3, 9x3 1/2

MILLS, PLAIN, UNIVERSAL & PROD.

Brown & Sharpe #600, 12, 21, #2A Univ., 2B PL.
Burke #4 Plain & Univ. Vert. Hd.
Cincinnati 2M Univ.—12, 1-18, 2-18 Mfg.
Kent Owens #1V: U.S. Hand Mills
Milwaukee #2HL, 2H Univ., #2HL, 2H Plain
Nichols Hand. Vert. Hd.: U.S. Multimiller
Sundstrand 66 Rigidmill; Whitney Hand Mills
Van Norman #12, 22L, 38; U. S. 1 & 2 sp.

MILLS, VERTICAL

Bridgeport Vert. Slotted, Hor. Sp.
Brown & Sharpe #2
Cincinnati #4
Gorton #3D, 3J Plain, 8 1/2" Dupliator
Sig Jig Borer SMP-5
Index, Jackson, Vermon
Milwaukee 3H, 3H
Morley #12M Profiler 2 sp., P. & W. 12B
P. & W. 1 1/2" B Jig Borer, Moore Jig Grinder

PRESSES

Bliss 675, 630, 645B Hi-Production Presses
P/iss #8 Dbl. Crank, Bed 42"x100"
Bliss 19, 20, 21 G.H., 58, 62, 62A 182 OB.
Bliss #4 1/2" Double Action, Rail Feeds
Henry & Wright 75 Ton Dialing, 25 Ton

HYDRAULIC EQUIPMENT

Cap.	Manufacturer	Platen	Stroke	Opening
500 Ton	Lake Erie	35x38"	38"	68"
600	Bald. S' thru'k	78x59"	22"	30"
500 D.A.	H.P.M.	58x36"	24"	30"
(160 Cushion)				
1000	French Oil	53x42"	20"	50"
300	Brand New Watson Stillman Hobbing Press			
375 D.A.	Elmos	84x44"	12"	42"
(90 Cushion)				
350	Verson	48x40	38"	72"
50	Dennison	22x20	18	23
150	Southwark	84x30	30	2' to 4'

UP MOVING RAM PRESSES

50 & 100 Ton Stakes Molding Presses & Pumps
300 Ton Dunning & Boschert Molding Press
600, 800 Ton Waterbury-Farrel 3 & 4 Rod
Presses, 6 & 8 1/2 strokes
300 Ton Watson Stillman Press, 24x20" Platens
400 & 500 Ton Shaft Straighteners—Self Contained

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Famous—Band Saws Kalamazoo—Drill Presses all sizes—Grinder Surface, Abrasive #1 1/2"—Hydraulic Press Northern 70 Ton—Injection Molders, 1 ounce—Power Presses, OBI, 4 1/2", 5, 7 1/2", 10, 12, 18, 30 ton—Shaper, 7" Ames, 8" Shaperite—Shaper, Sheldon 12"—Shears, Foot 22" to 8", 16 & 18 ga.—Shears, Power, 3"x18 gauge to 10"x18 ga.—Welders, Arc, Seam, Spot all sizes—Vert. Milling Attach. Halsey, N.S.—Motors, Grinders, Buffers, all sizes

Thomas 80 Ton O.B.I. #7A, Z & H 30 Ton
Toledo 400 Ton Knuckle Joint
V. & O. #258 O.B.I., #102 O.B.I. Reducing, #6

TURRET LATHES

Acme #6W Bar & Chuck, Acme 6W Fox
Bardons & Oliver #3, 1 1/2" cap., #3, #2
Brown & Sharpe #1, 2F, Hand
Gisholt #4, 6 Bar & Chuck, 1L, Foster #3B
Hardinge ESM Second Operation
J. & L. 8A—Well Tooled
Morley #3, 1 1/2" cap.
Oster #601 Rapiduction, well tooled
Warner & Swasey #5, 4, 3, 4A Universal

MISCELLANEOUS

Band Saw; Tannowitz #36M, DeAll ML
Bending Roll; Buffalo #0, 1/2" WR, Excelsior #14
Hackaw; Marvel #40, 6A Automatic #6
Hardness Tester; Clark
Honer; Micromatic #H-1, Sunnen Riveters; HI Speed
Koyester; Davis, Baker, # & M
LaPointe #3L Horiz. Rydr.
Press Brake; Chicago #335
Router; Onsrud #W340, 35
Saws; Wells, Catskill, Peerless, Kalamazoo
Shaper; Gould & Eberhardt 32" Univ. Industrial, Latent
Slotted; P. & W. 6" Vert. Shaper
Shaper; 8" Shaperite, 7" Atlas
Shear; Pexto 6"x14 Ga.
Tappers; Bakewell #1, Haskins #2C, 3C
Thread Roller; Waterbury-Farrel #30 with Dies
Welders; Seam & Spot; Thompson, Taylor-Winfield, Selaky

BOR. MILL, Horiz. No. 50 G&L, 5" bar M.D.
BORING MILL, Vert. 14" Niles, 2 Hds., M.D.
BRAKE, Press 36" x 1 1/2", 40" throat, Late
BULLDOZER, No. 4 Williams & White
FORGING ROLL, No. 5 Ajax, Air Clutch, M.D.
GRINDER, Surf. 16" x 120" Mattison Hyd.
HAMMERS, Pneumatic Nos. 48 & 68 Hazel
HAMMERS, Steam Drop, 2,000# Chambersburg
MILLER, Ingersoll, 3x4x16", 3 Hds., M.D.
MILLER, Vert. No. 4 Campsmith, table 18" x 74"
PRESS, Hyd., 250-Ton Chambersburg, 30" x 36"
PRESS, No. 59 Toledo, Str. 12", Bed 30" x 30"
PRESS, No. 59 Toledo Str. 14", Bed 36" x 37"
SHEAR, Plate Type "E" L&A, 60" x 1 1/2", 20" thr.
SHEAR, Plate 132" x 1 1/2" Morgan, 2 1/2" Throat
STRAIGHTENER, 48" American, 13-Rolls, 23"
STRAIGHTENER, 54" 17-Roll McKay, Backed Up
STRAIGHTENER, 17-Roll McKay, 60" x 4 1/4"
UPSETTER, 2" Acme
LANG MACHINERY COMPANY
20th St. & A.V.R.R. Pittsburgh 22, Pa.

LATHE—BRIDGEFORD, 32" x 21" C. to C. (old)
LATHE—GUN BORING, 64" x 65" (late)
PLANNER—GRAY, 60" x 60" x 40" (Tolerance .003)
PRESS—TOLEDO, #185, 1440 tons, D.A.
SHEAR—R. D. Wood, 7' x 1", 18" gap
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quick change gear box; 12 geared
spindle speeds; power rapid traverse;
AC 3/60/220/440 motor and controls

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tween centers 10'6". Bed 16'6" long. 15 HP
400-1600 RPM 230 v. DC motor. C.H. Mag.
Controls.

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GA., 9 TOP ROLLS, 8 BOTTOM ROLLS,
51" x 4" DIA. ROLLS, FORCED FEED
LUBRICATION, COMPLETE WITH D. O.
JAMES SPIRAL 8 EVEL REDUCTION
UNIT, AND 20 HP, 230 VOLT, DC
MOTOR AND CONTROLS.

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IN EVERY RESPECT

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BORING MILLS—Horizontal

CINCINNATI GILBERT 3 1/2" bar, floor type, latest
LUCAS #41, 3" bar, Table Type, "Precision", latest
LUCAS #43, 5" bar, Table Type "Precision", latest
NILES-BEMENT-POND 5", 8" bar, floor type, M.D.
UNIVERSAL, 3" bar, high speed, latest type

BORING MILLS—Vertical

BULLARD 12" & 14", 6 spin. Multi-Au-Matic, Type
D. Single or double indexing, latest
BULLARD 24", 36", 42" "Spiral Drive", latest type
KING 82", 3 swivel heads, Rapid Traverse, M.D.
NILES 100", 2 swivel heads, PRT, D.C., Motor Dr.

DRILLS—Miscellaneous

AMERICAN 4' arm 11" col., "Hole Wizard" latest
LELAND & GIFFORD #2LMS, 3 & 6 spindle, latest
PRATT & WHITNEY, 1 1/2x50" Deep Hole, latest

GEAR CUTTING EQUIPMENT

FELLOWS 61A, #61, #7, #7A, #72, #725, #77,
#2, #623 High Speed Gear Shapers, latest type
GLEASON 3", 12" straight bevel generator, latest
GLEASON 24", 77" & 96" Bevel Gear Planer, M.D.
GOULD & EBERHARDT 15H, 96H Hobber, Motor Dr.

GRINDERS—Cyl.—Plain & Univ.

BROWN & SHARPE #1, 2, 3, 4 Universal, latest
LANDIS 4x12, Type H, Plain Hyd. latest type
NORTON 6x18", 10x12", 18x36", 14x36", Plain, latest

GRINDERS—Miscellaneous

BARBER COLMAN #3, 4, hob sharpener, latest type
CINCINNATI #2, #4 Centerless "Filmatic", latest
HEALD 75A, 72AB, 72AB, 74, Internal, latest type

GRINDERS—Surface

BLANCHARD #11, 16" Magnetic chuck, latest type
HANCHETT #36, Vertical, 36" mag. chuck, latest
HANCHETT Series 120 Plano, Horiz., 30"x120", latest
HANCHETT Series 300, 12"x18" Vert. Sp. Hr., latest
HEALD 25A—Rotary—16" and 30" chuck, hyd., latest

LATHES—Engine & Mfg.

AMERICAN 36"x360" centers, 2 carriages, motor dr.
LODGE & SHIPLEY 14"x30", 16"x30" Centers, latest
MONARCH 18"x30" centers, Model 5B Timken, latest
MONARCH 12"x30" Centers, 12x54" Centers, Model
CK, Timken Bearing, latest type
MONARCH 22"x54" centers, 3 carriages, Timken
Bearing, Model CM, motor drive
NILES 30"x50" Boring, Timken, latest type
NILES 60"x55" Centers, 2 carriages, Heavy Duty,
Rapid Traverse, latest type

LATHES—Turret

BARDONS & OLIVER #5, #7, Timken, latest type
FOSTER #4FU "Fastermatic", Timken, latest
GISHOLT #1L, #2L, #3L, Universal, Timken, latest
GISHOLT #3, #4 Univ., TIMKEN, latest type
JONES & LAMSON #1, #3 Univ., Timken, latest
MOREY No. 20, No. 3, No. 4, Timken Bearing, latest
WARNER & SWASEY #2A, #3A Univ. Timken, latest
WARNER & SWASEY 4A Universal, Timken, Bar
and Chucking (New 1947)

MILLING MACHINES—Plain

BROWN & SHARPE 2B, 3B, Timken, latest type
CINCINNATI 6-8, 1-12, 4-36, 2-18, Simplex, latest
KEARNEY & TRECKER 1218, 1404, latest type
KEARNEY & TRECKER 2H, 3H, 4H, 5H, latest

MILLING MACHINES—Thread

LEES BRADNER 12"x54", 6"x36", latest type
MOREY 12"x30" and 60" centers, latest type
PRATT & WHITNEY 6x60", Model C, latest type

MILLING MACHINES—Universal

BROWN & SHARPE 2A, 3A, Timken, latest type
KEARNEY & TRECKER 2H, Timken, latest type
VAN NORMAN #12, #26, #36, Timken, latest

MILLING MACHINES—Vertical

BROWN & SHARPE #2B, Timken, latest type
CINCINNATI #2, #4, Dial Type, Timken, latest type
GORTON 8D, 8 1/2D, Super-Speed, latest type
KEARNEY & TRECKER 2E, 3H, Timken, latest

PLANERS

BETTS (CONSOLIDATED) 84"x92"x18" 4 heads
Box Table, Power Rapid Traverse, D.C., M.D.
BETTS (CONSOLIDATED) 108"x54"x50", 4 heads,
Box Table, Power Rapid Traverse, D.C., M.D.
NILES "Time Saver" 42"x42"x14", 3 heads, Rapid
Traverse, A.C., vari-voltage drive, latest

SCREW MACHINES—Automatic & Chucking

CONOMATIC 2 1/2"—6 spindle, latest type
GOSS & DELEEUW 6"x6" Auto Chucker, latest
GOSS & DELEEUW 8" Auto Chucker, 5 spin, latest

MISCELLANEOUS

BARNES #172, 306H, 307, 307B, Vertical Hone,
Hydraulic, Self-Oiling, latest type
CINCINNATI 1-30, 3-36, Duplex Vert. Surface
Breach, Double ram, Model ER Hyd., latest type
CINCINNATI Series 300 1/2"x8" Press Brake, M.D.
HENRY & WRIGHT 50 ton Dicing Press, M.D.
LAKE ERIE 500 ton Vertical Hydraulic Press, latest
MICHIGAN 1708, 1712 Universal Reliever, latest
VERSON #206, 10 gauge x 96" cap. Press Brake latest

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Continued from Page 170

present activity is approaching the normalcy of natural supply and demand.

Trends Reported Mixed in Detroit During Last Quarter

Detroit—The trend in used machinery in the Detroit area is mixed as the year draws to a close. While some sources report a substantial upturn during the final month of the year, other segments of the industry have indicated that the recent spurt in the market here gives indications of tapering off. Year-end buying because of possible corporation tax benefits has failed to develop any definite trend, dealers find.

Under a recent tax ruling, the declaration date in Detroit for personal property tax purposes has been changed from Mar. 31 to Dec. 31. Some sources believe that this will act as a deterrent here insofar as sales of rebuilt equipment are concerned during December.

While volume and inquiries are spotty, prices at several recent auctions have been surprisingly high according to local trade sources. It is reported that competition between dealers and consumers for surplus equipment has inevitably resulted in higher prices than dealers, who usually expect to rebuild the equipment, are willing to pay.

Two recent auction sales have been reported in this area. On Nov. 30 a substantial amount of equipment was sold by the Novo Engine Co., Lansing. Another sale of equipment is scheduled for Dec. 6 when machinery valued at \$100,000 will be sold by Bowers Tool and Die Co., Kalamazoo, Mich.

Krasilovsky Moves Deering Plant

Stamford—The machine shop equipment together with the laboratory and research departments of the Deering-Milliken Greenwich and Stamford, Conn., plants is being moved to their new plant in Pendleton, South Carolina by the Mike Krasilovsky Trucking & Millwright Co., Inc. of New York.

Resume Your Reading on Page 171

BORING MACHINES

2 1/2" No. 25T Giddings & Lewis
3 1/2" No. 3A Universal
3 1/2" No. 32 Lucas
5 1/2" Jones planer table type
52" King vertical
100" Niles-Bement-Pond vertical
No. 2112 & 1128 Excella precision
Nos. 42, 47A & 48A Heald Borematic

DRILLS

20" No. 2 Mfg. Colburn
20" Cint. Bick. Super Service Mfg.
21" Conedy Otto
21" & 24" Cintl. Bickford
24" Kokomo
24" Cint. Bick. Super Service
No. 217 Baker 3 spindle
Nos. 121, 310, 315 & 513 Baker
No. 30MO Baker
3", 10" Morris radial
4" 11" Cint. Bick. Universal radial
4" Hammond radial, elbow arm
6", 15" Dresses radial
16" Allen 6 spindle, No. 2
24" Demco 4 spindle, No. 3
24" Foote Burt & spdl., No. 2
24" Allen 4 spdl., type 2K H

GEAR MACHINERY

Nos. 3 & 12 Barber Colman
Types A & T Barber Colman
Nos. 6 & 72 Fellows
Nos. 8H, 12H, 14HS & 18H Gould & Eberhardt
Nos. 1, 5A & 5AC Lees Bradner
No. 130 Cleveland Rigid hobber
No. 5M Adams Mfg. hobber and spline miller
3" Gleason spiral bevel gen.
No. 7 Gleason cutter grinder
18" Gleason testers & lappers
No. 8M Fellows Red Line Checker
24" Flatner auto. spur
8"-12" Red Ring shaver
8" Red Ring lappers
Barnes Hut-O-Lap lappers
No. 4 Cimatoool rounders

GRINDERS

6"x18", 10"x18", 10"x36", 10"-14"x72" & 16"x36"
Norton
4"x18", 6"x18", 10"x18", 10"x24", 14"x36" &
16"x72" Landis
6"x18" & 6"x32" Brown & Sharpe
Nos. 1, 2 & 13 Brown & Sharpe univ.
10"x24" Landis universal
24" No. 226 Gardner disc
30" No. 372 Beely horiz. disc
36" No. 239 Hanchett opposed disc
16" No. 214 Hanchett opposed disc
15" No. 115 Gardner opposed disc

LATHES, ENGINE

14"x6" Lodge & Shipley
16"x6" Monarch
16"x10" American
18"x8" Hendey
18"x8" Rockford
18"x12" Bradford
19"x8" Leblond
20"x8" Lodge & Shipley
25"x8" centers Leblond
36"x16" Bridgeford

LATHES, TURRET

Nos. 2, 3, 4, 1A & 3A Warner Swasey
No. 7 Bardons & Oliver
Nos. 2 & 3 Morey
Nos. 3, 4, 5, 3AL & 28" Gisholt
4, 2 Denver
No. 4 Midland
No. 3 Jones & Lamson
No. 5 Foster
3"x36" & 4"x34" Jones & Lamson
24" & 36" Bullard vertical
No. 2FU Foster Fastermatic

PLANERS & SHAPERS

30x24x6" Liberty O.S. planer
20" & 24" Gemco shapers
14", 20" & 24" G&E shapers
24" Columbia Universal shaper
6" P. & W. vertical shaper

FORGING TOOLS

2" National Upsetter
4" Ajax upsetter
No. 4 Ajax forging roll
No. 5N Hazel air hammer
400 ton Hamilton forging press
3/4" Wat. Farrel OD SS cold header

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STRAYER ELECTRIC

• Erie Strayer-Electric buckets either AC or DC are standardized in 7 sizes ½ thru 2 cu. yard capacities. Motor in bucket head controlled by man in crane cab—Bucket hooks-on for intermittent bucket and crane hook work. Write for details. Address 8912 GEIST RD.



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Continued from Page 28

sumed that they will be income-tax free.

Many labor leaders of Parliament are hoping mad about these payments which they describe as gifts. The companies maintain that the payments are made merely to safeguard their interests and ensure that a valued chief executive does not move to a rival concern. Labor leaders argue that they are deliberately designed to avoid payment of income taxes.

Hermann Goering Furnace Being Rebuilt for Norrbotten

Stockholm—The large blast furnace of the Hermann Goering works at Linz, Austria, dismantled and transported to Lulea, Sweden, is now being rebuilt there for the Norrbotten Iron Works. Once it is in operation, the capacity of the Norrbotten works will be raised from 250,000 tons to 300,000 tons of iron a year. This will make it the biggest iron works in Sweden.

The Norrbotten Iron Works' investment plan calls for a total expenditure of 200 million kronor. The increased employment in the works will raise the population of the town of Lulea to 30,000.

Subsidies Against Inflation

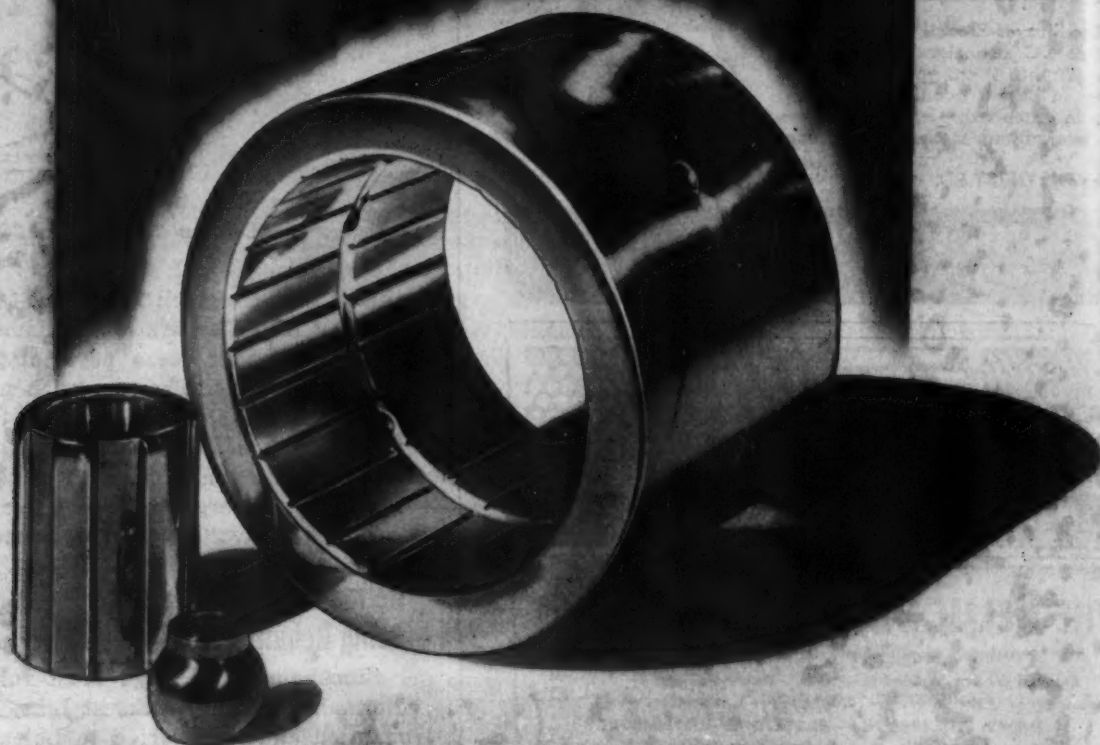
The Swedish government has asked Parliament to approve subsidies totalling 190 million kronor to keep prices down following devaluation. The subsidies will be taken from the planned 400 million kronor surplus on next year's budget.

The government has undertaken to keep the cost of living down if organized labor will accept a wage freeze for the whole of next year. Labor has provisionally agreed to this.

New Ford Factory

The Ford Motor Co. has opened a new factory at Stockholm's Free Port. The new building is an extension and modernization of an older factory. It will concentrate on the assembling of vehicles—French Vedettes, British Ford lorries and vans. Maximum output is estimated at 15,000 vehicles a year.

Resume Your Reading on Page 29



Buy Bunting Bronze Bearings

When you buy Bunting Bronze Bearings you receive more than just a physical bronze bearing. More than forty years of experience, the technical skill of thorough metallurgists and engineers, the output of equipment designed for closest tolerance and finest finish—these and more are an invisible part of each Bunting Bronze Bearing and Bar.

A sales organization of graduate engineers is able to intelligently

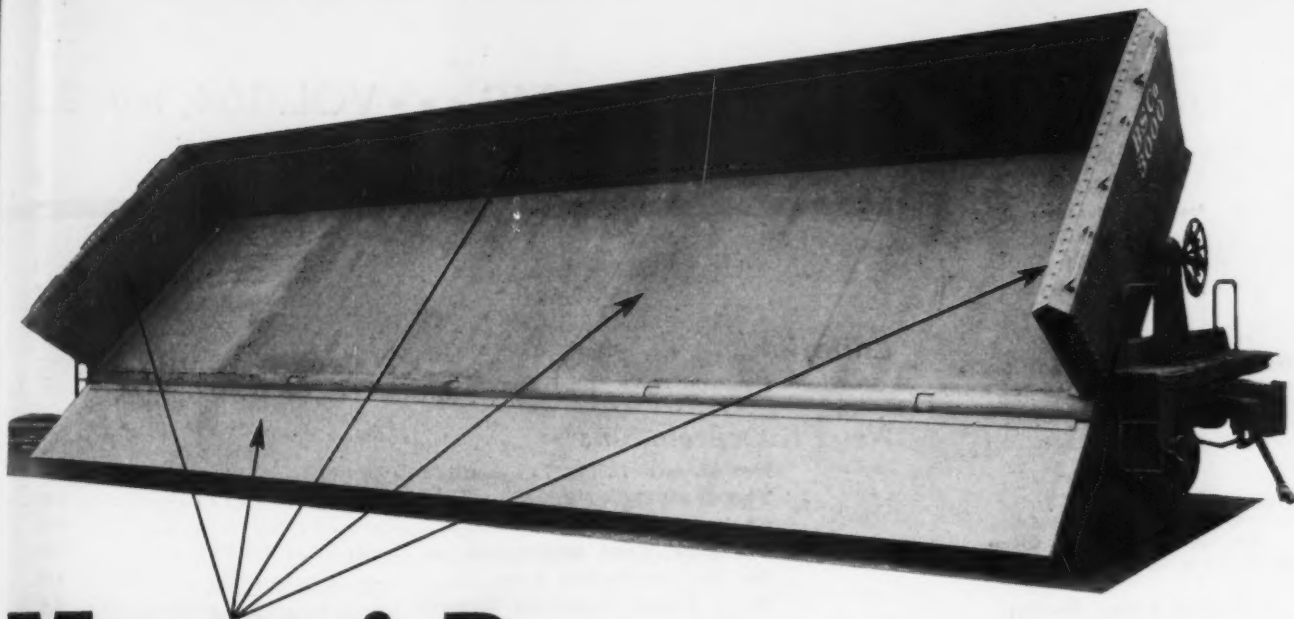
discuss your design and production problems with you. A manufacturing organization that moves swiftly responds to your production schedule on time.

When you buy Bunting Bronze, the entire Bunting organization is alert to the fact that you are a customer and that you want service as well as a product. The Bunting Brass & Bronze Company, Toledo 9, Ohio. Branches in principal cities.

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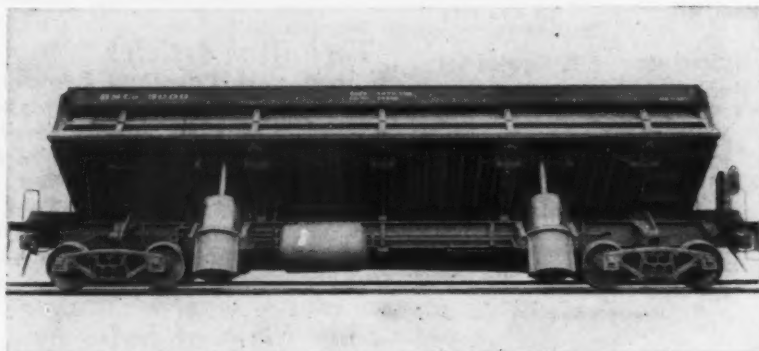
BRONZE BEARINGS • BUSHINGS • PRECISION BRONZE BARS



Mayari R protects these parts from corrosion and abrasion

These air dump cars were designed and built by Magor Car Corporation for use in industrial plants where atmospheric corrosion and harsh abrasion ordinarily take a heavy toll in equipment. Floor plates, end plates, and inside door plates of Mayari R steel were used to protect the cars at the points where damage is most likely to occur. In addition Mayari R structural shapes and rivets were used in the bodies and underframes.

Mayari R was selected for this job because of its superior properties. Compared with plain carbon steel, Mayari R has 5 to 6 times as much resistance to atmospheric corrosion . . . better resistance to impact and abrasion . . . better resistance to battering and denting . . . considerably greater strength.



A low-alloy, high-strength steel, Mayari R is also used by equipment builders and railroads to reduce surplus dead-weight and increase overall strength in hoppers, gondolas and box cars.

We will be glad to show you how you can benefit by the use of this versatile steel in your equipment or products. Write or phone our nearest sales office for catalog and full information.

One of 61 air dump cars recently built by Magor Car Corporation. These 70-ton, 50-cu. yd. cars use Mayari R steel for all inside parts that come in contact with the load.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation



Mayari R *makes it lighter...stronger...longer lasting*

December 15, 1949

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Editorial

Open Season for Experts 7

News Interpretations

Newsfront 11
The Iron Age Summary 15
Global Letter 28
Machine Tool Highspots 32
On the Assembly Line 40
West Coast Progress Report 44
The Federal View 48

Special Features

Fatigue Cracks 20
Iron Age Introduces 21
Free Publications 34
New Production Ideas 35
The Economic Side, J. S. Lawrence 120
Dear Editor 162
Dear Customer 174
The Clearing House 184

Technical Articles

A Practical Evaluation of Ductile Cast Iron, Part II 77
Arc Welding Molybdenum-Rich Alloy 82
Friden Adopts Electric-Sprayed Wrinkle Finish 83
Scale Reduction in Controlled Atmosphere
Cycle Annealing 86
Air-Hardening Tool and Die Steels, Part III 91
Spraying Paint With Steam 95
Determination of Arsenic in Lead and Tin Alloys 96
Ceramies for High Temperature Use 98

Spot News of Industry

New England Explores New Financing Plan 113
Dates to Remember 117
Industrial Shorts 118
NAM Hear Taxes and Welfare State Deplored 119
Alcoa, Union Views Differ on Long Strike 122
Appraises European Machine Tool Market 123

Markets & Prices

Market Briefs and Bulletins 133
Nonferrous Metals Outlook 134
Nonferrous Prices 135
Iron and Steel Scrap Market 136
Iron and Steel Scrap Prices 138
Comparison of Prices 140
Steel Prices 142
Miscellaneous Steel Prices 143
Stainless Steel, Pipe and Tubing Prices 145
Warehouse Steel and Pig Iron Prices 146
Ferroalloy Prices 147

Index to Advertisers 198